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States turn to private solution

By Peter Young

DARWIN — A stumble by Telecom has strengthened chances that private communications networks for both the Queensland and Northern Territory governments could be run by the same operator.

The NT government has broken off detailed discussions with Telecom on its proposal to run the government's planned private network as a turnkey contractor (*Communications World*, April, p3).

A spokesman for NT Industry and Development Minister Marshall Perron declined to spell out

(Continued page 2)

IBM shop pioneering X.25 links

Garry Latham with the System/38 which is breaking new ground with X.25.

By Peter Scott

ROZELLE, NSW — A pioneering approach to X.25 use will bring great savings and efficiencies to nationwide data communications for an IBM System/38 user.

The user, Carrier Air Conditioning, believes it has achieved an Australian first in getting PCs in its branches to talk to its central System/38 via X.25 without protocol conversion.

Garry Latham, Carrier's MIS director, said the low cost link will allow the company to bring about realtime communications with six branches which at present have no direct links to the System/38.

"At the moment we have point-to-point communications via leased lines with branches in Adelaide, Melbourne, and Brisbane, as well as to the telex network. But we have no direct links with offices in Canberra, Wollongong, Darwin, Townsville, Newcastle and Perth," he said.

Those outlying branches input data on IBM's 5285 data entry machines, which have limited intelligence and have now been discontinued, and physically transport eight-inch diskettes to head office.

"We have a very good service analysis program, and at the moment these remote branches key the data on to diskettes, which are sent into head office once a week. The day after they arrive the general manager here has access to all figures, but the branch managers don't," Latham said.

"Our problem was to give those branches direct access to the System/38 for a two-way transfer of information".

Latham said that a number of alternatives were considered, including installing and programming PCs and, again, sending diskettes weekly to head office. The disadvantage was that a PC specialist would have to be put on the payroll.

Finding the answer

The possibilities of putting the branches online via leased lines could not be cost-justified because of the low volumes of traffic.

An alternative that made sense but could not at the time be implemented was the use of PCs in the branches with some sort of emulation card to give access to the System/38 via Austpac.

The System/38 was configured to talk to Austpac about 12 months ago. "IBM had some problems configuring the line, and so went to the US to get the expertise," Latham said.

The problem was then to find a suitable board for the PCs, and

(Continued page 2)

Telecom tests for benefits in fast packet switching

MELBOURNE — International moves to incorporate a full range of services, including voice, into fast packet switching are being closely monitored by Telecom.

Research has been conducted by Telecom's Research Laboratories for the past two years and has progressed to the stage of development of an experimental switch, explained Jim Park, assistant director of switching and signalling.

"There is no commitment for Telecom to use fast packet switching for voice or the other services," Park said. "Telecom is researching from the point of view of a technology that we ought to know about.

"It is attracting a lot of attention overseas."

Wolfgang Schau of German company Comtes, which provided the Compas X.25 card to solve Carrier's communications problems (see story this page), said while in Sydney recently that the CCITT was examining a new standard for fast packet switching that would include protocols to cover all services.

"X.25 is now a dominant protocol, and there is no argument that at some time in the future almost all communications will be by fast packet switching," he claimed. "Its major advantage is that it is protocol independent.

"Timing in fast packet switching is uncertain, though, it will have to wait for ISDN."

Park noted that the CCITT will not attempt to add voice to the X.25 standard, which will remain purely data.

"Fast packet switching would seem to be an extension of ISDN," he noted. "We would expect it to use optical transmission to get higher bit rates. It would offer greater bandwidth and more packet mode services.

"That will give more data faster, and has obvious benefits in the transmission of graphics, although in Europe the emphasis seems to be on video services."

Park also noted that AT&T had conducted a trial in the US last year. The internal, 10-month test had covered all services and had apparently been successful, he added.

"However, the majority opinion said we should not expect public networks based on fast packet switching before the mid-1990s," Park said.

Ford plans net across US

DEARBORN, Michigan — Ford Motor Co plans to build a US-wide network of high speed digital lines to carry packet switched data and digitised voice to its 6000 company sites. The network will consolidate 28 separate voice and data nets into a single system.

Ford has signed M/A-Com to provide the packet switch equipment to transmit the packetised data.

As a first step in the project Ford is hooking 22 of its facilities to its corporate headquarters over 41 high speed leased lines. This part of the network will handle all voice communications and half the data communications traffic of the sites involved.

The company, which spends $US100 million a year on communications, expects to reap a number of benefits from the new network, including a 50 per cent reduction in costs through the sharing of high speed digital transmission facilities.

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Nuclear scientists have had enough of Smut

Donald Richardson . . . optic fibres better.

By Peter Scott

LUCAS HEIGHTS, NSW — Smut is to be phased out of the Australian Atomic Energy Commission (now know as the Australian Nuclear Science and Technology Organisation) as that body lays the groundwork for a communications network applicable to the 1990s.

Smut, more formally the Serial Multiple User Terminal System, was a terminal access system designed by the commission's staff in the early 1970s. Its use is to be wound down following the planned installation of an optic fibre backbone around the site. Dr Donald Richardson, chief of the applied mathematics and computing division, said tenders for the fibre optic system have been called and evaluated and the commission is preparing to sign a contract.

Richardson said that once the backbone is installed the commission will take a slightly unusual approach to linking its many computers and terminals. There are more than 100 terminals on the site and the list of computers includes an IBM 4381, a Pyramid 90X, and a variety of machines from DEC and Data General. All are interconnected by networks developed by the commission's staff.

"Some two or three years ago we started looking at RS232 standard offerings. We thought of using intelligent boxes with about eight to 10 RS232 lines per box, and with the boxes able to talk to each other. From this we developed our specification for the network of terminals.

"Within each building will be connections to Ethernet. The intelligent boxes will plug into Ethernet to communicate with other boxes around the site. Thus any terminal will be able to talk to any other terminal," Richardson explained.

"We can also group bundles of terminal lines and take a reverse terminal approach to a host computer, where we just make the host look to the system like a bundle of terminals. It is all driven by the intelligent boxes.

"All we are interested in is providing RS232 sockets on walls so that people can plug in their cheap terminals or PCs as they wish.

"We are now looking for a turnkey operation to provide the boxes."

Richardson commented that it was preferable to use optic fibres because the Lucas Heights site is on an iron lodestone ridge and is subject to considerable electrical interference. "We hope the optic fibre backbone will take us into the 90s, because it will cope with speeds orders of magnitude faster than are now possible," he noted.

Ethernet campus link

By Noel Bennett

KENSINGTON, NSW — The increasing importance being placed on standards is exemplified by the University of NSW choosing optical fibre cable with Ethernet for a campus-wide network. The network will link 15 of the most important buildings on campus.

A spokesman said the multinode cable is capable of carrying at least 215M-bits of traffic a second in the long term. The initial rate with Ethernet will be 10M-bits/sec.

However, the higher traffic rate is in tune with directions being taken by the IEEE standards body. AT&T is pushing for this speed for metropolitan networks and the Ansi Private Distributed Data Interface standard also covers this speed.

The Led-driven optic fibre backbone network will link in with Ethernet-style Lans within the selected buildings, which are populated by a variety of minicomputers and mainframes including DEC Vax and PDP minis, Prime and Pyramid minicomputers, and an IBM 4300. The network will accommodate the different operating systems. Facilities to be available include host-to-host communications for file transfers, electronic messaging and remote log-in, allowing a person to log into one computer and then gain access to another.

A gateway, based on a DEC Microvax, will provide access to outside services, such as Telecom's Austpac network and the proposed inter-university Spearnet network. The network will be an adjunct of the existing Academic Computing Unit data switching network and PABX systems.

Of the six fibres going into each building, two will carry Ethernet traffic and the four spares will be available for other applications such as video.

Terminal boxes will facilitate any change to the topology of the network to accommodate new circumstances.

DEC Australia is the prime contractor for the venture, expected to be completed by mid-July, with building links then progressively implemented.

Data calls: timed rate

MELBOURNE — Telecom is to impose time charges for local data calls on information service providers. The charge means that from mid-1988 exchange lines rented for client access by information service providers will be metered.

The calling client will pay only the initial meter registration (now 18^c), but the information service provider will be charged for any excess holding time. David Gannon, Telecom's dedicated network services manager, said rates had not been finalised but that $A3 an hour in business hours and $A1 an hour after hours could be used "as a guide".

He stressed that the system would not affect charges for voice calls or data calls of similar average duration.

Gannon said the charges were necessary because long-hold data traffic cannot reasonably and economically be accommodated on the telephone network, which has been developed for voice traffic with an average call duration of less than three minutes.

Railways to instal emergency net

SYDNEY — The State Rail Authority of NSW is to instal a $A5 million dialup radio telephone network to put maintenance and emergency personnel in immediate contact with any SRA telephone extension throughout the coverage area, which will ultimately extend from Wollongong to Newcastle.

Designed and manufactured by Plessey in Australia, the system includes more than 1000 Plessey MTR 8000 series UHF vehicle and personnel receivers, nine base station sites, plus a network management centre at the Chullora depot. All sites are connected by microwave links.

A spokesman said that up to 32 channels will allow immediate communication between SRA offices and personnel in the field, or between portable and vehicle radios.

Network News

Late news breaking from the daily IDG News Service

*WELLINGTON, NSW — Telecommunications users are optimistic that the NZ Parliament will tone down some of the stiff provisions of the State Enterprises Restructuring Bill establishing Telecom Corp as a separate entity from the Post Office (*Communications World, *April, p6). In submissions to a select committee considering the Bill, users and industry groups asked for a wider choice of supply, and reported that members of the committee were "cognisant of the need".*

FRAMINGHAM, Mass — Digital Equipment Corp has unveiled the Dectalk Voice Response System, based on the Microvax II, which allows users to access databases via AT&T Touch-Tone telephones. It can be used as a standalone unit or a frontend to corporate databases on any computer that can be accessed via a DEC network. The $US40,000 Dectalk stores data in Ascii format and reads it out over the telephone.

LONDON — Plessey Co PLC has won a $US100 million order for digital telephone exchanges from South Central Bell Telephone Co. The contract won by Plessey's subsidiary Stromberg-Carlson Corp, calls for the installation of 600,000 lines by 1990. Most of the equipment will be built in the Stromberg-Carlson's plant in Florida.

LYONS, France — IBM is working with Renault to develop gateways that will link IBM hosts and DEC Vax processors in a peer to peer fashion using OSI protocols. A Renault spokesman said his company, IBM and French software company, Marben Informatique, are designing gateways that translate application level ISO protocols to comparable SNA protocols. The gateways are expected to be completed by the end of this year.

SAN FRANCISCO — A Federal Court judge has upheld an action by US Robotics Inc to include Hayes Microcomputer Products in an antitrust and patent infringement suit it originally filed against Business Computer Corp. US Robotics is trying to forestall actions by Hayes and Bizcomp to enforce patents they hold and to collect royalties from other manufacturers of Hayes-compatible modems. US Robotics claims the patents are invalid because they are based on existing technology. A date for the new trial has not been set.

ARMONK, New York — In the latest move to mold Rolm Corp in its own image, IBM has replaced Rolm president Dennis Paboojian with a long time IBM executive, Ray AbuZayyad. Paboojian took over as president when Ken Oshman, one of Rolm's founders, left more than a year ago. An IBM spokesman said Paboojian left for personal reasons, but will serve as a consultant to IBM. AbuZayyad is expected to revamp Rolm's manufacturing operations.

Telecom stumbles on State networks

(Continued from page 1)

the precise reasons for Telecom's fall from grace. However, other sources said talks with Telecom had failed to confirm initial indications of cost savings and range of services.

When expressions of interest were invited last September, Telecom tabled a proposal the NT government saw as offering a $A76 million saving over a 10-year period. The government believes a private network configuration can cut 30 to 60 per cent off its communications costs, depending how the net is structured.

Its communications bill last year using the public system topped $A10 million and it is looking for large future savings in a communications grid linking all government offices in 135 NT locations.

The NT administration has made no secret of its preference for a private company as network operator, especially one willing to set up assembly or manufacturing facilities in the Territory as part of the deal.

With Telecom removed from the ranks of front-runners, the government is focusing its interest on two other companies, McConnell Dowell Nichols Pty Ltd and Icom Ltd.

Both are expected to be prime contenders for the right to operate Queensland's Q-Net, a job on which final proposals are due on May 27.

The recent developments emphasise the strong parallels between the two government networks.

User pioneers X.25 solution

(Continued from page 1)

the solution has just come to hand with the release in Australia of the Compas board from German packet switching specialist Comtes GmbH (see page 5).

Trials have been completed and once applications for Switched Virtual Circuits are approved by Telecom the system will become fully operational. Latham hopes to begin installation in about six weeks.

"Our communications will be via six PCs, each fitted with a Compas card. Each branch would have needed a 5294 controller for about $A10,000, a screen for about $A2500, and a printer for about $A9000.

"The Switched Virtual Circuits are about $A2000 a year each, which is much, much cheaper than leased lines."

"It is a tremendous breakthrough. The branches will now have full access to all our business systems, as well as to internal electronic mail and international telex."

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'Law to blame' in PABX slump

NORTH SYDNEY — Telecom's local manufacture requirements have been highlighted as a key reason for slow growth in the Australian PABX market in 1986 — although the sluggish year was exacerbated by the ending of the Federal government's tax writeoff incentives for new capital equipment in 1985.

A Technical Services report on PABX by Compass Research states that Telecom's regulations have raised the cost of entering the market for Australian and international companies.

"All suppliers not already manufacturing in Australia must invest in local production to meet local requirements in what is for them a small market. Although the exchange rate is favorable for such enterprises, the investment risk is considerable and local manufacture and assembly may not fit with international suppliers' global strategies," the report stated.

The absence of the capital expenditure writeoff also made 1986 a tough year for PABX suppliers, as many purchases were brought forward a year to take advantage of it. A further problem pinpointed in the report was an increase of up to 28 per cent in PABX prices due to devaluation of the dollar.

Compass found that the PABX market has also been eroded by the rapid growth in sales of small business systems, such as Telecom's Commander, or key phones, which now represent 20 per cent of the installed base of business telephone extensions — almost the same as that of PABX lines.

As well, the Australian market for PABX, small though it is — worth $A160 million last year — is hugely competitive, with almost every worldwide manufacturer of systems represented.

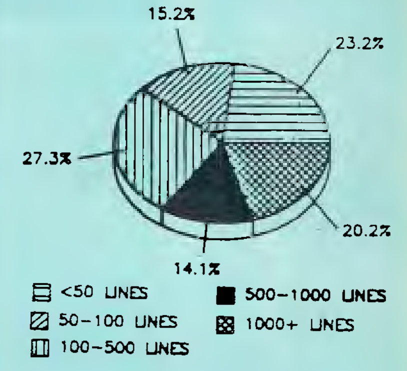
The report found that not all was gloomy, and predicted a turnaround in the market this year due to the resumption of deferred capital purchases and a further shortening of the replacement cycle stimulated by the announcement of ISDN.

The expected improvements in the market will be fuelled by the replacement cycle, which is shortening from 10 to 15 years in the 1970s to five to eight years in the 1980s, Compass noted.

The report also outlines major problems for potential users in the purchase of data communications equipment.

Compass Research is at 99 Mount St, N Sydney 2060. Tel: (02) 957 1377. Fax: (02) 959 3914.

Percentage PABX market growth forecast for 1988 by PABX line capacity size



Source: Compass Research

Market fears spark rethink at Telecom

By Noel Bennett

CROWS NEST, NSW — A likely radical restructure of Telecom, which will make, free play of the word "profit," has been driven by falling revenues and the threat of increased competition.

Officially, Telecom is undertaking studies designed to make it a more efficient, customer-based and profitable organisation.

However, reports published elsewhere, but not commented upon directly by Telecom, note that the most likely outcome of these studies is the division of Telecom into three profit centres.

One will be dedicated to its top 400 customers and new technologies. The second, a business services division, will look after smaller businesses and specific business networks. The third, general services, will handle domestic installations and be responsible for STD, ISD, public telephones and directory services. A fourth divison could provide support services.

Such proposals would seem to be imperative, given the information in an internally circulating document.

The document said the transmission market is very profitable, but notes this could increase pressures to open routes to competition.

However, the weak points in Telecom's operations lie in the terminal and value-added services market. According to the document, these markets could result in losses in the vicinity of $A100 million in 10 years' time.

The small business systems market could be expected to contribute more than half of this loss; the position of the PABX market is expected to worsen; and directories are expected to contribute practically all of the $A200 million profit expected to be made by value-added services.

In addition, the document notes that Telecom's customers are becoming increasingly advanced in their telecommunications planning, have greater mobility in seeking their own solutions, and are becoming less tolerant of perceived Telecom shortcomings.

The document notes that Telecom must prove itself, and decisons made must support the network and the core business, and also be profitable.

Profit centres would be a means to that end. Telecom said it could not comment on the document.

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ISDN study shows pros and cons

By Noel Bennett

NORTH SYDNEY — Telecom's Integrated Services Digital Network (ISDN) promises to make entry by a new communications carrier more difficult, but it will offer users advantages in the form of lower operational costs, an increased range of services and greater flexibility.

Speaking at the launch of Logica's report, *ISDN in Australia*, Peter Saalmans said one body of opinion held that if AT&T had introduced ISDN facilities 10 years earlier it would not face the competition it does today.

Putting ISDN in place will similarly protect Telecom he claimed.

Peter Saalmans . . . protection for Telecom.

Preparation of *ISDN in Australia*, which was partly funded by Telecom, took a Logica team eight months.

***ISDN in Australia* costs $A490 from the publications manager, Logica Pty Ltd, 157 Walker St, N Sydney 2060.**

Lans are rich seam for mine

By Peter Scott

BROKEN HILL, NSW — The installation of two Ethernet Lans on its mine site has given ZC Mines the ability to link a number of different computers, to rationalise its network strategy, and to save costs on future terminal purchases.

Bob Theaker, project manager for computing, said the company recently completed installation of the two Ethernet components talking across a gateway and running along four twisted pair cables. The Lans comprise Bridge equipment and are linked by Bridge gateway devices, Theaker explained.

"We have a number of computers on site, including a Fujitsu M360R mainframe, a DEC Vax 11/750, a Perkin-Elmer (now Concurrent) 3220, and more and more PC ATs," said Theaker.

"Users want networks for their ATs, and we had a number of networks in place all using different types of terminals and all needing their own sets of cables.

"In addition, synchronous terminals for the Fujitsu were fairly expensive, which was a major factor as the environment can't always be clean. We haven't needed replacements, but they would be expensive."

The Lan solution was suggested after a study conducted by Hously Computer Communications. "We liked the Lan proposal as a cheaper solution to all these problems," Theaker said. The Bridge equipment was tendered by Network Solutions Australia Pty Ltd.

ZC Mines selected Beehive data terminals for use on the Lans. "They gave good emulation of synchronous style screens and the 3278 keyboard. We were also able to program the terminals to turn themselves into VT100s," Theaker noted. "We think we get the best of both worlds with the 3278 screen and the VT100 mode for links with the Vax or the PE machine."

At the moment the company has 28 terminals, but that number will increase with time. There are also plans to put five of them down mine shafts to allow enquiries on the supply, costing and maintenance planning systems running on the mainframe and minis. The underground terminals will be linked to line drivers which in turn will be attached to terminal servers on the networks.

"We have put an SNA protocol converter connecting to the Fujitsu mainframe, an Ivecs card into the Vax, and are using basic terminal server connectors to the PE," said Theaker.

"We are still experimenting with some connections like the PE and the PCs."

X.25: Compas points way

THORNBURY, Vic — A PC card that is claimed to offer low cost access to X.25 communications has been released by Professional Australian Systems.

A spokesman for the company said the Compas card, from German company Comtes GmbH, provides viable communications for companies wishing to establish continuous branch to head office communications without the high costs of leased lines or for 3274 controllers and network interface adapters at each remote location.

"The Compas card provides all these functions on board and also appropriate terminal emulations," the spokesman claimed. "It can emulate an SNA 3270 system with two logical units operating under SNA/SDLC to enable remote locations to communicate via X.25 (Austpac) with IBM and Fujitsu hosts. But it can also soft switch to an Ascii terminal to run sessions via X.25 with virtually any other asynchronous host," he claimed.

Each card has an inbuilt remote diagnostic channel that enables support and network troubleshooting to be carried out via the X.25 link. Each card has an onboard CPU, and the interface to the PC and the network is direct memory access supported, enabling the PC to interface in standalone operation with the network.

Further information from Professinal Australian Systems, 883 High St, Thornbury, Vic 3071. Tel: (03) 480 4688.

*HP-UX B. 1 and 5.2 HP's implementation of AT&T's UNIX System V Release 2.0 running on the Model 840 and the Series 300 respectively have been tested and using the AT&T System V Verification Suite and conform to the Base System (Model 840) and the Base System plus Kernel Extensions (Series 300) as specified in Issue 2 of the AT&T System V Interface Definition

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'Huge hidden costs in Lans'

SAN FRANCISCO — Installing and operating a local area network (Lan) of just 20 workstations can cost users more than $US400,000 over three years, according to US consultant David Ferris.

Ferris told users at a seminar conducted by the Technology Transfer Institute that hardware and software expenditures are just the tip of the total networking cost iceberg. Equipment costs account for about 10 per cent of overall net spending, while the costs of managing a Lan and training users can be more than two-thirds of the bill, Ferris claimed.

Over three years installing and running a network of just five workstations can cost users more than $US155,000, while implementing a 20-workstation Lan costs more than twice as much.

Ferris said that 48 per cent of the overall cost of operating the five-workstation Lan over three years goes to systems administration — installing, managing and maintaining the network.

Training accounts for 17 per cent of the total spending and another 17 per cent goes to what Ferris called "user fiddling". He estimated that each enduser on a network spends at least an hour each week resolving network-related problems, such as fixing a printer. "That costs companies a great deal of lost productivity," he claimed.

Network hardware and software account for only about 9 per cent of the overall cost. Another 9 per cent goes to network specialists, who help users choose, instal or plan for the network.

For a 20-workstation network, systems administration costs drop to 37 per cent, but the cost of user fiddling jumps to 26 per cent of overall network expenditures. Training costs also increase to about 23 per cent of the total, while hardware and software costs remain roughly the same, Ferris claimed.

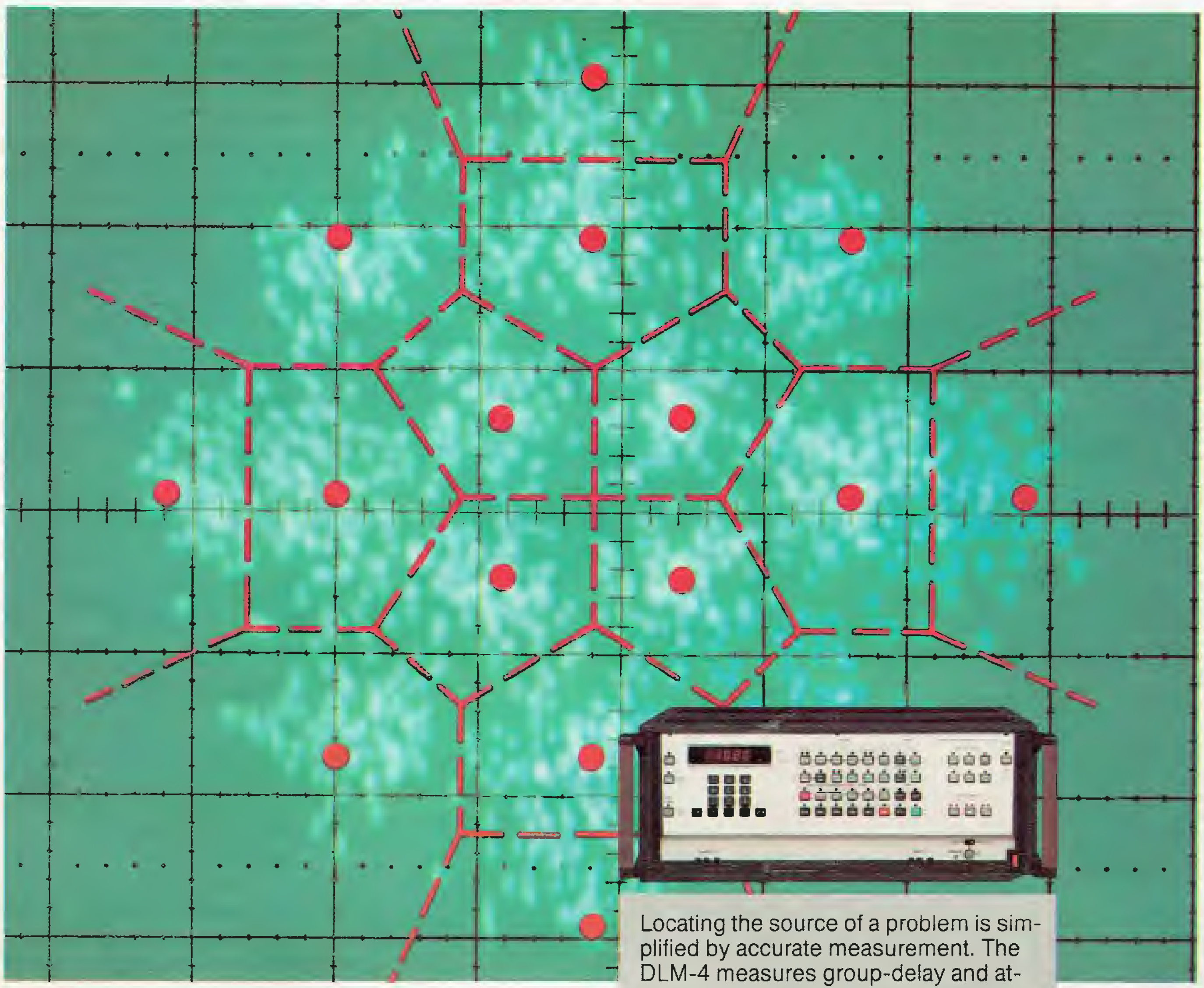
Ferris explained that the spending estimates were based on information gleaned from his company's work in helping users instal networks.

Network Installation Costs

	Number of Workstations 5	 40	 80
Basic hardware and software	$10,000	$52,000	$88,000
Cabling and installation	$3500	$16,000	$32,000
Lan specialist support	$13,200	$19,800	$24,200
Systems management training	$4000	$4000	$4000
User training	$4500	$36,000	$72,000
Total installation costs	**$35,200**	**$127,800**	**$220,200**
Cost per workstation	**$7040**	**$3195**	**$2753**

All dollars $US. Source: Ferrin Corp, San Francisco

Wandel & Goltermann
Electronic Measurement Technology



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☐ *AFTER conducting a comprehensive survey into integrated services digital networks (ISDN) and its proposed implementation in Australia, Logica believes it has a firm grasp on the technology and on Telecom's plans for it. As a Logica spokesman explained, potential users will have to wait and see what Telecom proposes before they set their corporate futures in concrete, but one thing is for certain, he added: "ISDN will enable Telecom to charge innovative tariffs if they want to". What's new about ISDN?*

The unspeakable

☐ *ARCHETYPAL US entrepreneur Gordon Matthews of VMX Inc may have set rolling the whole concept of voice messaging while in a rage (see page 34), but he has a clear view of what the technology is capable of and what users want. While Matthews was in Sydney recently he told potential users of his Vox system that speech to text translations were not a high priority. "I don't think there is a place yet for speech and text together," Matthews explained. "If you could see your speech typed out you'd never speak again!"*

The earful quantified

☐ *WHILE conferences of all types have their share of hot air, despite the best intentions of their organisers, speakers and delegates, one participant at Atug seems to have found a new measure to apply to the verbiage. Bob Mounic, the ubiquitous executive director of the Australian Information Industries Association, told the audience at one of the final Atug sessions that by his reckoning they had received from the three-day conference "20,000 earfuls of information".*

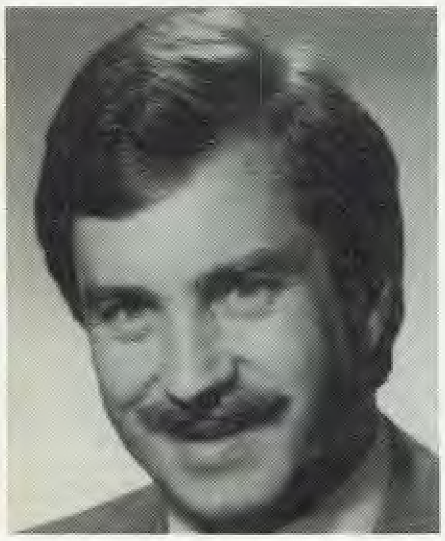
Your own buzzword

☐ *BUZZWORDS come and buzzwords go, and some will reap rewards for those with enough imagination to grasp them at their flood.* Communications World *has found a word of almost unsurpassed potential that is destined for stardom. In fact, we have it on very good authority that the word about to take us all by storm — "plesiochronous" — is already on its path to Australian stardom. Diverse Devices has found only one person who admits to knowing the true definition of plesiochronous (or, if it comes to that, even having heard of the word before). Readers with good imaginations will no doubt be able to come up with their own definitions. The most imaginative will be rewarded with a prize of suitable magnitude — a pair of Reebok aerobic shoes that are guaranteed fully compatible with the total communications philosophy of the Great Sneaker Lan. Definitions (and shoe size) should be sent to the editor of* Communications World, *arriving no later than May 20. Results — plus the technical definition — in our June issue.*

Communication?

☐ *THE information industries have so butchered the English language that interpersonal communications will never be the same. Before the proliferation of personal computers the word "format" was strictly a noun. Now, of course, we all happily "format" our disks — turning that mild-mannered noun into an almost acceptable verb. But the latest horror transformation must surely be in "verb-alisation" (if we may use such a term) of "remote". One US visitor spoke to Diverse Devices recently about his company's ability to "remote devices", when he meant the ability to connect distant devices that were intended to be installed side by side.*

Datacraft scores modem exports



CROYDON, Vic — Datacraft has won several large export orders for its new Australian designed and manufactured 5099 Universal Modem. The orders are worth $A1.2 million and have been placed through Datacraft, Hong Kong.

The company's export development manager, Dr David Wynn (pictured) said users included airlines, postal, phone and telegraph organisations, and newsagencies throughout Asia.

"The new modem comes in a Data Pump (DP) point-to-point version and for users who require high-speed multidrop configurations, a Fast Train (FT) version is available," Wynn said.

Datacraft was expecting further significant orders for the new modem in coming months, he added.

Tytel gets the nod

By Noel Bennett

ARTARMON, NSW — Telecom has approved Tytel Pty Ltd as a PABX supplier but the company has to await a decision as to whether it can market a PABX it developed itself.

A spokeswoman said the approval meant Telecom considered Tytel had the necessary business background and financial resources to support installations in the long term — essentially, that the company was not primarily concerned with short-term gains only, but was in for the long haul.

Tytel submitted its own PABX for Telecom for approval for connection to the network some 12 months ago. Apparently, this waiting period is not unusual and the spokeswoman said the company had used the time to further enhance the product.

In October 1985 it was reported in *Computerworld Australia* that Tytel had received a grant of "a couple of hundred thousand dollars" from the Australian Industries Research and Development Incentives Board to develop and manufacture a PABX. Telephone products which came out of that development resulted in a legal dispute between Tytel and Telecom.

DEC gets Post net

MELBOURNE — Australia Post is embarking on a five-year, $A25 million plan to establish a national distributed processing network.

Digital Equipment Corp won the hefty tender, knocking out incumbent supplier Data General with a bid for equipment ranging from Microvax 2000s to clustered Vax 8530s and 8350s on a combination of local and wide area networks based on Decnet and Ethernet.

Datacraft Australia Pty Ltd is subcontractor to DEC and will supply ancillary data communications components.

US retailer needs Australian solution

PERTH — Ross Stores of California has bought the Australian CP Blue micro-to-mainframe link boards to solve a data communications problem affecting a point of sale (POS) network in 135 of its stores around the US.

The company, which has an annual turnover of about $US500 million, had failed to find a solution in the US.

Central to Ross's network is a Tandem computer running Storelink software. In each store is a Tandem 6AX, which is compatible with an IBM PC/AT, and a number of NCR cash registers controlled by an NCR 751 controller.

The 6ZX runs the store resident portion of Storelink to perform functions such as price look up, transaction formatting, enquiries on the central database, and other store-related monitoring and control functions.

Control Protocol's CP Blue boards allow PCs to be located in the stores along with the existing NCR controllers and cash registers.

The board is inserted into each PC to provide a communication link using the NCR bisynchronous protocol to the central Tandem and a connection to the NCR 751 controller.

The boards extend the use of the leased communication line to each store and provide an improvement in store operating efficiency through interactive features it makes available to store management.

Customs books Aussat capacity

SYDNEY — The Australian Customs Service has leased satellite capacity from Aussat in order to establish the first stage of a national voice and data communications network.

Terry Slater, first assistant comptroller-general in Customs' systems division, said the service's operations covered all capital cities and almost 50 other inland and coastal outports.

He added: "Dedicated satellite links, combined with PABX facilities being provided by Telecom, will ensure more rapid exchange of information and more efficient and cost-effective conduct of business."

Initially the links will consist of 12 lines — six between Canberra and Perth and six between Canberra and Adelaide. These links became operational last month. By 1991, 26 extended lines will be in operation as well as up to 42 privately owned earthstations.

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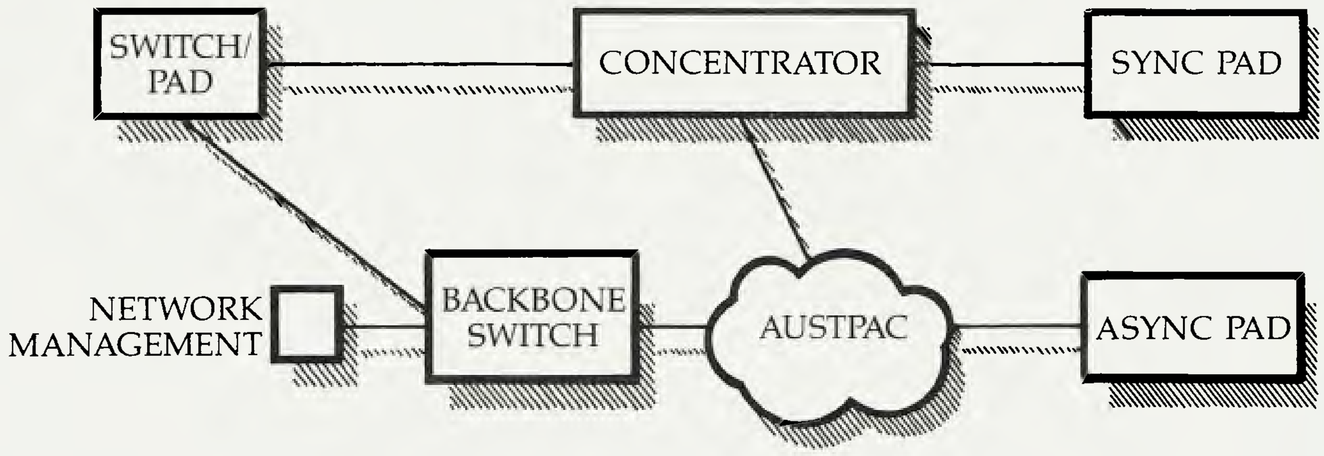

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Monopoly and ISDN both hot Atug '87 topics

By Peter Scott

SYDNEY — From a pre-show breakfast to the closing speech, Telecom's monopoly and integrated services digital networks (ISDN) dominated the thinking at Atug '87, the annual conference of the Australian Telecommunications Users Group last month.

Tony Staley, Atug chairman, didn't even wait for the conference to open before firing the first shots against Telecom. At an opening day breakfast he reiterated his claims that while Telecom was obliged to comply with the provisions of the Trade Practices Act, its actions were outside the law.

"The matter of Telecom's interconnect policy concerns the whole of industry, including State governments and private enterprise. Specifically, it is not open to Telecom to refuse to interconnect private networks," Staley said.

Discussions about Telecom were further fuelled by remarks in the opening speech of Michael Duffy, the Minister for Communications, who hinted to more than 500 delegates that changes were contemplated to Telecom's controversial regulatory powers so that it would not be "both a regulator on the one hand, and on the other, at least in some areas, a force in the market".

"You will be aware of the changes taking place within Telecom management structures and systems to improve efficiency and respond to changing customer needs," Duffy told the conference.

"The commission has also advised me that it is looking carefully at how best it can manage the discharge of its domestic regulatory functions within the framework of government policy."

The hint of dramatic changes was seized gleefully by most conference delegates, but no firm details of what would be involved or when any changes were likely to occur were forthcoming from the minister or Telecom representatives.

Other contentious issues the government was considering in its policymaking were the complex problems involved in private, or leased networks; first instrument and customer premises strategies; and PABX maintenance, Duffy noted.

With the catalyst in place, debate simmered on through the conference's first two days, then erupted on the final day after a highly critical address by Edward Realf of NUS International Pty Ltd.

During a session with the theme "Getting it right", Realf delivered his paper entitled *Tariff Policies — Alternative Strategies*. Jim Holmes, Telecom's manager, legal and policy, asked (and was granted) leave to reply from the rostrum.

The wide-ranging paper contained a strong criticism of Telecom's cost-efficiency performance and presented an alternative approach to tariff structuring and pricing that Realf claimed would greatly benefit business consumers. "Alternative tariff strategies could be based either on: cost of supply charges bringing timed local calls, reduced charges for long distance calls, and distance-related rental charges; or demand commodity charges bringing a dual component based on the fixed costs of providing a service and the use of those facilities," Realf told delegates.

Michael Duffy, Minister for Communications (left) explains the intricacies of telecommunications policy-making to (from left to right) Stan Kabala of AT&T, Edward Realf of NUS, and Bryan Carsburg of the UK's telecommunications watchdog Oftel.

Realf also claimed that cross-subsidisation as practised by Telecom was discriminatory and "theft by deception". It should be abandoned in favor of a pricing policy related to the true costs of supply, he claimed.

While Telecom is forced by its charter to balance social objectives with efficiency of operations objectives, the vehicle used to achieve this — cross-subsidisation — was "not so much subsidisation as price disparity," Realf claimed.

"A pricing policy that involves the provision of services at a uniform charge irrespective and regardless of different costs either due to distance, location, or use of facilities, is price disparity and is merely called subsidisation because it is perceived as being more palatable," he claimed.

Accepting that continued use of cross-subsidisation is almost inevitable, Realf then turned his attention to the secrecy with which Telecom shrouds its financial dealings. He claimed that it was impossible to obtain figures on the true levels of subsidisation because Telecom seemed to believe it was not accountable to anyone. "If cross-subsidisation is necessary it should be overt and not undertaken without the consumer's knowledge," he said.

No accountability

Realf's criticisms of Telecom's efficiency were based on data published by Telecom and a number of other telecommunications carriers in the UK, US and Canada. His figures were based on such criteria as financial operating ratios, internally generated capital ratios, exchange line services per employee, and revenue generation per employee.

"Telecom publicises its cost efficiencies, but a comparison study of its performance in several critical areas alongside four other international telecommunications organisations places it a poor last," he claimed.

After such strong words, and the volatile reaction from Telecom's Holmes, a good crowd was ensured for the afternoon's debate, "Regulation through the public sector is better for business", at which Holmes was again expected to fire.

Speakers at the debate included Atug's Wally Rothwell, Mick Musumeci of the Australian Telecommunications Employees Association, Bob Mounic of the Australian Information Industry Association, and Barney Blundell of AAP Reuters Communications.

Rothwell kicked off the debate with a lively listing of problem areas and complaints against Telecom and its monopoly. Like Realf, he was critical of Telecom's accountability, describing it as "very poor and confusing for users". He called for the establishment of an independent regulator because "Telecom cannot be both a player and the umpire", a phrase that had almost become the catchcry of the conference.

Lively debate

In putting the Atea's view of Australian telecommunications, Musumeci appeared to be Telecom's only external supporter. He made it clear that his association was fully in favor of preserving the status quo with, if anything, more support by way of funding from the Federal government.

The AIIA's Mounic reiterated his body's recently forged strategy on telecommunications (*Communications World, April, 1*).

Blundell from AAP also questioned Telecom's monopoly, claiming it was not a technical necessity, was not more efficient, did not bring support for a local industry, and did nothing to create jobs.

He, too, called for more accountability, especially in rural subsidies. "Telecom must say where the money comes and is spent. We must know where our dollars are going," he said.

In front of a fired-up audience Holmes then took the rostrum. If fireworks had been expected, they were not forthcoming as Holmes gave a broadbrush overview of Telecom's objectives and the need to "balance goals". He said as an example that a universal service at an affordable price was "contradictory to private networks".

At the conclusion of the debate the conference moved on to an open forum, where most questions were directed at Holmes. Interest was maintained by Holme's claim that Telecom had no plans for general timed local calls, although it was preparing to announce timed local data calls on data services offered as products or for gain. "We are not talking about data calls made from a person's home to his company's mainframe. That has an impact on the public network, but is not the aim of our policy," he said.

Holmes also indicated that rumors of an early freeing of the policy of PABX maintenance were unfounded. "They're rubbish. I don't expect anything for some time," he claimed.

And so Atug '87 wound to a close. Users expecting fireworks from the conference had found little to entertain them, and inspiration was in short supply under Telecom's towering stone wall.

Nonetheless, users had been fed enough positive information and hints about a less powerful Telecom monopoly to strengthen their resolve. The mood is strengthening, change is in the air, and Atug '87 played a major role in stressing the need for that change and, it is to be hoped, in speeding its implementation.

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SAA cornerstone is laid

A close look at the fine print of SAA, together with details of the first products to use it.

ARMONK, New York — IBM has formally announced its Systems Application Architecture (SAA), and with it laid out a framework for developing applications that run across all its major hardware lines.

The architecture, which company spokesmen likened to Systems Network Architecture, defines software interfaces, protocols and other conventions that will enable users and software developers to write applications compatible with the latest (and future) offerings in IBM's personal computer family, with the System/3X midrange series and with the System/370 processor lines.

IBM will also develop its own applications under SAA.

A spokesman said the implementation of SAA, like the implementation of SNA, would be an evolutionary process. The first step will be the provision in the third quarter of 1987 of documentation that defines SAA. It will be followed by products that fall under SAA's broad reach.

The SAA blueprint consists of four related elements: Common User Access, Common Programming Interface, Common Communications Support, and Common Applications.

Common User Access defines the basic elements of the enduser interface to applications, including screen layout and menu presentation. IBM has been criticised in the past for supplying customers with inconsistent interfaces across its software line.

Common Programming Interface defines an application programming interface for SAA-compatible programs. The interface specifies the languages and services to be used in developing applications that can be integrated with other applications and ported to different environments.

Languages specified in the SAA announcement are Cobol, Fortran, and C. Other programming components outlined the Common Programming Interface are a database interface based on IBM's Structured Query Language (SQL), an application generator based on elements of the Cross Systems Product, and a query interface based on extensions to the interfaces in the Query Management Facility.

Common Communications Support defines communications tools to be used in linking SAA applications, processors and networks. The spokesman said the communications methods have been chosen from existing SNA and international standards.

Common Communications Support specifies the use of four types of data stream. The 3270 data stream will be used for communications with IBM mainframes, and the 5250 data stream will be supported for interactions with System/36 and System/38 machines. A third data stream, the Document Content Architecture, defines the rules for specifying the form and meaning of text documents to enable users to exchange documents.

The intelligent Print Data Stream can be used with all points-addressable page printers, but documentation describing this data stream will not be released until the third quarter of this year.

Three types of application services are also specified under Common Communications Support. They are SNA Distribution Services, which supports asynchronus transmissions used with store and forward applications; Document Interchange Architecture protocols that define office automation functions used with a number of IBM products; and SNA Network Management Architecture protocols that provide a vehicle for monitoring network operations from a central location.

Data link controls supported within SAA include Synchronous Data Link Control and IBM's Token-Ring Network.

Common applications will follow progressively as IBM develops common software that runs across SAA environments. The focus initially will be on office applications, and later industry-specific packages.

IBM's Systems Application Architecture

Common Applications	Calls for IBM to develop applications that can run across IBM System/370, System/3X and Personal Computer environments.
Common User Access	Defines a consistent enduser interface, including screen layouts and menus, to all IBM applications and environments.
Common Programming Interface	Describes programming tools used in developing applications that can be integrated with other applications and ported to multiple IBM environment.
Common Communications Support	Outlines the protocols, products and services used to interconnect applications, systems, networks and devices.

IBM comms, PC bonanza

SYDNEY — Soon after the US announcement of Systems Applications Architecture (SAA), IBM made a worldwide announcement of a family of personal computers, the first products to fall under SAA.

The Personal System/2 and its multitasking operating system are expected to support advanced networking capabilities by 1989.

In conjunction with the new PCs, IBM also announced enhancements to existing network offerings.

The Personal System/2 family includes models based on Intel's low-end 8086 chip, on the 80286 processor, and on the high-performance 80386 chip set. All will run an enhanced version of the PC-Dos operating system, version 3.3, while the models based on the 80286 and 80386 will also run the new multitasking Operating System/2 (OS/2).

OS/2 will be available in two versions, although users will have to wait for the extended version, which is expected to offer true communications support.

SAA components incorporated in OS/2 include the user interface and the graphics program interface; support for C, Cobol and Fortran; an interface to SQL; and support for network management services and communications protocols.

In the communications announcements, IBM extended host connectivity to the Personal System/2 family via the 3270 Connection adapter and software, which are said to provide 3270 emulation and file transfer capabilities through a link to 3274 and 3174 cluster controllers.

A baseband version of the broadband PC Network was also introduced. It operates with existing IBM PCs as well as the new machines, operates at a claimed 2Mbit/sec, and uses a contention access scheme.

Addressing criticisms of existing network offerings in the area of network management, IBM announced the ability to run a single network manager on multiple Token Rings interconnected with bridges.

IBM also released the Lan Manager version 1.0 to help in network problem determination and error recovery. It can run as an application of Netview/PC, forwarding alerts to a host resident Netview for remote operation.

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EDITORIAL

Telecom must not be tight-lipped

TWO of the biggest issues confronting telecommunications users became the driving force at Atug '87 — Telecom and emerging technologies.

The all but incompatible nature of the two subjects caused a clear partition in the year's major communications conference in Sydney last month. Delegates were forced to assess the merits of papers delivered and make their choice according to where they placed most importance.

One of the few fields where technologies of the near future overlapped interest in Telecom was ISDN. Coverage of the subject was gratifyingly broad, from basics to technical details, with a good clarification of Telecom's intentions for the digital technology.

But by and large new technology and Telecom took separate paths. Telecom, it goes without saying, had been expected to create the most interest, if not fireworks.

In fact, fireworks were few and far between. It seems users and vendors alike have discovered there is a certain futility in public Telecom bashing.

However, a flashpoint was reached several times, most notably in the detailed and controversial paper delivered by Edward Realf from NUS International, and in the debate on the final afternoon.

Realf attacked Telecom with a broad brush, criticising its efficiency as measured against overseas carriers, its monopoly, its tariffs, and the powers it assumed from its monopoly.

But it was Telecom's secretive approach to business that really drew Realf's ire. In preparing figures for an alternative rating structure and to show the inequities of the cross subsidisation scheme he had been unable to unearth any precise results from Telecom. The figures were not for public dissemination.

"I discovered a great variation in the cross subsidisation figures that are produced by Telecom. I have therefore consistently doubted their accuracy," Realf noted in his paper.

His wide ranging address delivered the clear message: Telecom must be made accountable. And his call was echoed several times during the last afternoon's debate. The public has a right to know how Telecom spends its money.

While Telecom's charter imposes some social obligations on the commission, it does not give it the right to hide the cost of those obligations behind a veil of secrecy.

The debate was interesting in that none of the speakers called for an end to cross subsidisation. It was accepted as a necessary and justifiable burden.

But it was accepted as a burden borne by the majority of Australians, and in particular by the business community. Several speakers said it was therefore of prime importance that the public be informed of where the "Telecom dollars went".

And that indicated the mood of Atug '87. It was not a year of boots-and-all Telecom bashing. It was a calmer approach. The single most important message delivered at the conference by users, speakers and equipment vendors was that if Telecom claims to work for the good of Australians, then Telecom must be made accountable to Australians.

We can avoid Vsat problems

LETTERS TO THE EDITOR

From: Colin Campbell.
Chief marketing executive,
Aussat Pty Ltd,
Sydney

THE opinion on Vsat viability in your March issue (CW, March. p16) provided a very critical view of Vsat services in the US. but failed to address the Australian scene.

As most readers of *Communications World* know, Aussat has introduced its own Vsat services. Starnet, and OTC has also announced an international Vsat service. Satnet III. Many of the problems encountered in the US will be avoided here.

For example, the comment "economics is the biggest obstacle to large numbers of users buying Vsats" is misleading. It ignores that the prime reason for market interest in Vsats is one of economics. Vsat networks were developed for network applications and are not aimed at large numbers of independent users but large numbers of users in a network.

For larger branch networks. the Vsat solution is most attractive from an economic point of view. This is particularly true where the locations served are widely dispersed. and in some instances where there may be no terrestrial alternative!

The comment was also made that there are "extremely high start up costs". It was suggested that the central earth station (CES) "will cost at least $US2 million to instal and operate for five years". This figure, in the Australian context. is simply wrong — an overstatement by a substantial margin. But equally important, a key innovation with Aussat's Starnet is the concept of a shared hub, located at an Aussat major city earth station. This approach. which is simply having several customers share the CES. introduces considerable economies into the operation of the service.

For example. the typical total price for the Starnet pilot service is $A1000 per site per month where the service and equipment are leased from Aussat; that is where the customer's capital costs are zero. If. on the other hand. the customer chooses to purchase or lease the Vsats in his network. proportionate reductions on the price of Aussat's service are achieved.

The comments on reliability and performance are simply not true. It was said that "even what availability figures approach or beat those of telephone company circuits. the frequency of Vsat failure is likely to be much higher". This is a classic example of arguing that black is white. If there is a reliability problem then let that be demonstrated through practical experience. To say that the problem is there when the evidence contradicts it is arrant nonsense.

The true position in relation to Australian Vsats is as follows: there is a diverse range of Aussat customers who appreciate the intrinsic features of the Starnet service — its high bit rate performance. operational simplicity, its independence from other networks, and its attractive price — including options for direct customer ownership of the Vsat.

The Starnet service is currently being introduced as a pilot system for the Commonwealth Bank (CW, April. p1). The Commonwealth Bank will not be the only major customer for this product. (One significant difference between Australia and the US is the structure of our banking industry. particularly the incidence of nationwide operations).

There is also arguably a more entrepreneurial and innovative approach to the provision of entertainment and leisure services in this country and Aussat's customers have not been slow to identify new applications for Starnet in this area.

And of course. there are several outstanding examples of government operations in hundreds of locations across the country.

Vsat technology is not designed nor intended to solve all communications requirements. but the there is a sufficient number and variety of applications in Australia to ensure a viable future for the Starnet service.

EDITORS COMMENT: We reserve comment until the Starnet service proves commercial viability.

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Property database to link three States

By Noel Bennett

THE NSW Estate Agents Co-operative Ltd (EAC) is extending its co-operative effort to provide online facilities to counterpart organisations in Victoria and South Australia. This helping hand approach from Australia's largest real estate marketing group stems from the online facilities available to about 1000 real estate offices throughout NSW.

As the chief executive, Terence Bean, explains, one of EAC's objectives is to provide new services that will not only attract more members but also allow present members to improve their efficiency.

EAC started down the computerisation road when it installed an IBM System/34 in 1979. Under EAC's Multilist service, members send in forms detailing the properties they have been commissioned to sell. The forms are batch processed, the information then combined with photographs and sent to all members in the vicinity of the property.

This procedure is still followed after the installation of an IBM System/38 and accompanying telecommunications technology in 1984 except for one most important fact — members anywhere in NSW have the opportunity to obtain information about properties for sale direct from their IBM PC when used as a terminal.

On the other side of the coin, they can use the terminal to provide details of the properties they have for sale.

The database contains details of some 20,000 current properties and 40,000 sold properties at any one time.

Bean highlights the advantage of the online system by saying members who are not online do not receive the listed property information until some four to five days after receipt of the last item of property information for that particular issue.

However, sellers and buyers do not refrain from coming into an EAC office during that period. Accordingly, a great deal of information, and selling opportunities are not available to members during this "black-out".

Now, through the online system, all members can have an equal bite of the selling cherry.

Bean says EAC decided to upgrade to a System/38 after calling for tenders, responded to by some 20 companies. The intention to go online followed a visit by EAC management to the US, confirming their original thoughts that this was the way to proceed.

Innovak Computing Pty Ltd, a specialist communications company and an authorised IBM value added marketer, won the contract "as it gave the most detailed proposal on how EAC should perform its communications," Bean says.

"It did not have the attitude of saying, 'give us a bag of money and we will make it work, but do not worry how it will work'."

Innovak is authorised to market IBM Series 1, System/36 and /38 as well as IBM personal computers.

EAC has supplied software packages, known as Eacom, written by Innovak using Basic and Turbo-Pascal, to its members. The software covers real estate administration and property management and runs on IBM personal computers. Some large agents had been using Televideo multi-user office computers, since complemented by IBM PC ATs supporting multiple screens.

When the System/38 became operational for online applications in May 1985, Lear Siegler ADM 12 terminals were offered to PC users, and with the software available from Innovak, the PCs can be used as terminals.

Innovak essentially provides a facilities management service to EAC, responsible for the configuration and installation of the host and attached equipment, network design, program development and supply of Gateway proprietary communications software products.

The System/38 Model 18 is front-ended by two IBM Series 1 computers acting as network controllers. EAC is considering whether the Model 18 should be upgraded to a Model 600 with greater internal storage and 40 per cent faster processing speeds.

Terence Bean . . . EAC chief executive. ▶

(Continued page 12)

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DATATRAN

Bean with DP supervisor Armina Acopian.

Estate agents' database will reach three States

(Continued from page 11)

Innovak proposed the System/38 because it was a "relational database machine" and programming database applications was relatively very easy. Further, IBM had successfully overcome the lack of performance of earlier models which had given rise to the description "a Rolls Royce powered by a sewing machine".

The Series 1s hold the Gateway network communications software, which allows the acceptance of both asynchronous transmission from suitably equipped PCs in metropolitan areas connecting through the dialup network, and country PCs using the X.25 network. It is understood this X.25 network could be upgraded soon from 1200 to 2400 bits/sec.

The PCs in agents' offices are equipped with Comterm software, from Innovak, which allows the PCs to emulate IBM System/38 remote terminals and allows advantage to be taken of dialup facilities through a 2400 bits/sec modem. This software also enables the IBM PC JX and PC Convertible to have these transmission facilities, which are important if an agent wishes to work from home or in a client's premises.

The Comterm software also enables country members to automatically gain access by selecting an option rather than using the large and cumbersome code structure normally required for accessing X.25 networks.

The Victorian and South Australian Real Estate Institutes already market the Reicom software package to their members. This package is based on Eacom, modified to meet requirements of the specific State legislation. Besides being able to provide the same online realtime information, members of these institutes, as with EAC members, will have greater opportunities to expand their business.

For example, a home owner in Victoria could be moving to Sydney. Besides helping in the sale of the Victorian property, the REI member can obtain details of properties for sale in Sydney and so be of further service.

> *"Innovak gave the most detailed proposal on how EAC should perform its communications"*

Metropolitan REI members will dial the Melbourne and Adelaide-based concentrators to get on to the leased 9600 bits/sec lines running from EAC's computer centre to Melbourne and Adelaide. Country members will use Austpac.

These interstate lines can be upgraded to 48K-bits/sec if required. EAC decided against using videotex as it "wanted to control its own destiny" and videotex facilities seemed to be limited for the co-operative's applications.

Besides providing instant information as to what properties are for sale, the system can also be used to store clients' requirements if they cannot be met from existing properties. When a suitable property is listed, the System/38 can then alert the agent.

Other offerings include electronic mail, which will be more relevant when Victoria and South Australia come online, and a diary system to alert the agent when rates and other transactions have to be processed for a client.

Also, it a client's asking price is considered too high, often arrived at from incorrect information, the agent can use the online system to go through comparable properties and show their prices to the client.

The one perplexing question is the number of members taking advantage of this online system. At present, PCs are installed in 240 agents' offices, not all of which are online. Bean explains that members are only just getting used to the online concept, but he is very confident that those online will grow to 60 to 70 per cent of the total membership.

After all, as Bean points out, real estate agents have the same aim as manufacturers and retailers — to move stock as quickly as possible.

Until recently, if you've wanted high speed synchronous data transmission at 9600 bps, full duplex, you've had to pay the price of dedicated lines and rented modems.

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Linking micros to mainframes

How to find a way through the tangle of the micro-to-mainframe market?

Despite its name, the personal computer was never destined to be a device operated by users in isolation. As many users are finding, and as IBM's recent releases demonstrate so obviously, the product's clearest role in the near future is as a corporate tool linked — by whatever means is appropriate — to the corporate data workhorse, the mainframe. This month's special feature examines the methods by which personal computers may be attached to mainframes. The diverse opinions expressed by the authors indicate clearly that there is, as yet, no universal solution to the all important micro-mainframe link.

By Stan Kolodziej

THOSE IN MIS who are hoping the micro-to-mainframe link market is becoming a simpler world, find little in the marketplace to offer any solace.

The fact is, the micro-to-mainframe market has been multiplying during the past two years into several distinct but interrelated areas. The early link products, such as terminal emulation boards and protocol converters (both showing great staying power) have been joined by newer, vendor-integrated links, extended links and products that are nearly as much local-area network (Lan) and database as they are micro-to-mainframe link.

It is a world growing rich with choice — and potential frustration. Product categories are increasing with the number of corporate micro users wanting access to mainframe data. The result is a trade-off: while few MIS managers would wish to go back to the days when micro-to-mainframe links solely meant basic file transfer, there is no doubt there is more need for MIS to understand the market and get a handle on what types of links they need now and in the future.

Seymour Merrin, a vice-president at market researcher, the Gartner Group, claims that much of the current market confusion can be traced to both MIS and link vendors failing to realise just how difficult most micro-to-mainframe links are to instal and manage.

"You have to be a real corporate professional to handle links," Merrin said. "Vendors have oversold the simplicity of links, and MIS has underestimated what is involved. The fact is, I think most micro-to-mainframe links are still very slow, and the software that is required is extremely difficult to write."

Merrin sees a dilemma shaping within the micro-to-mainframe market. At this stage, he feels, there are no link products that offer complete transparency and ease of use to endusers. The software to do it can be written now but would be too expensive.

"I see some vendor storming the market with a truly transparent, affordable product, but not until 1988," Merrin said.

"It will be a third-party vendor, not IBM. I don't think the IBM culture is capable of producing the big link product. Their history in software speaks for itself.

"I think one thing is clear, however. The corporate mainframe users — and not just vendors — have to be involved in producing link products. Data on mainframes is proprietary, with diverse formats. It's a totally different need than packaged link software can deliver."

In the meantime, however, micro-to-mainframe product sales are climbing. International Data Corp. (IDC) sees the installed US-based of micro-to-mainframe

(Continued page 14)

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PC-TRACS COM 1 — allows IBM PCs (and compatibles) to communicate with each other using SDLC protocol. It offers high-speed automatic error recovery communications and file transfer without requiring mainframe intervention. It also provides interactive message exchange, password protection, and the ability to perform local PC-DOS commands on the remote PC. (The remote PC must be running PC-TRACS COM II).

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PC-TRAC 6.2 — allows a PC to communicate and transfer files as an LU 6.2 device in an SNA/SDLC network. It can be used for both PC-to-mainframe and/or PC-to-PC communications applications.

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Rich variety of connectivity options

(Continued from page 13)

software reaching 609,000 units shipped in 1986, up from 429,000 in 1985. IDC estimated the total US market of shipped and installed link software reached $US1200 million in 1986.

The US terminal emulation board market is also showing few signs of flagging. IDC estimates 225,000 board units were shipped in the US in 1986, up from 187,000 in 1985, and reaching 338,000 in 1987. No similar figures are available for the Australian market.

The market for emulation boards is still hot because the boards are less expensive than most current micro-mainframe software solutions, generally priced at a few hundred dollars. However, it is a case of getting what you pay for. Plug-in boards offer little more than basic file transfer capabilities.

Offering more in the way of capability are file transfer link products. These products use software resident on both micros and mainframes and enable users to restructure data they wish to extract from the mainframe.

So-called vendor integrated link products from such database suppliers as Cullinet Software with its ICMS; Information Builders with its Foctalk; and McCormack & Dodge with its PC Link, offer more sophisticated micro-to-mainframe links that interact directly with their proprietary database management systems to provide data extract and application development tools on micros.

Tempus-Link from Micro Tempus is part of a category of products known as extended links. These links generally combine database extract and virtual disk facilities for microcomputer users.

Micro Tempus pioneered the use of a virtual disk in micro-to-mainframe links to make file transfer easier for users and relieve the mainframe CPU part of the direct micro-to-mainframe link. Virtual disks are used on mainframe virtual drives that mimic PC disk drives. Functions that can be handled on a PC drive can also be handled on a mainframe virtual drive, and virtual disks create a common working and storage area accessible to both micro and mainframe.

Tempus-Access, the newest link product from Micro-Tempus, uses DYL-270, a data extractor from Sterling Software's Dylcore division that reads any sequential IBM Isam, Bdam and Vsam file structure while also interfacing with numerous DBMS such as Cullinet's IDMS, Applied Data Research's Datacom/DB and IBM's DL/1 and IMS.

Another extended link product making a splash is The Application Connection (Tac) from Lotus. Tac is a mainframe database extract application that has an integrated PC query and retrieval facility. Tac is also unique in that it does not actually perform any file transfer nor does it use the host to provide a virtual disk facility.

Tac, however, is used in combination with several leading file transfer products including Tempus-Link and Irma Link. Tac also supports a number of host databases and file formats such as On-Line Software's Ramis II and Information Builders' Focus. Unfortunately, Tac is not available in Australia.

The Lan gateway market promises to make some noise in the next few years. The market for gateway boards installed in Lan PCs used as servers was projected by IDC to amount to $US3.6 million in 1986, and it may climb to $US12 million in 1987. The market for gateway boards installed in dedicated Lan servers is expected to be higher.

Products like DCA's Irmalan, CXI's Pcox/Gateway and the Net/One PC System from Ungermann-Bass, offer connectivity to various mainframe hosts through hardware and software installations on Lan PCs.

Information Builders has used a unique approach with its PC/Focus-Multi-user product, which is a Lan implementation of PC-Focus supporting multiple concurrent users. PC/Focus-Multi-user works with networks from Nestar Systems, IBM, Novell, and AT&T.

A plus for the product is that Focus applications can be developed and executed on Lan PCs or sent to the host for execution.

A more popular approach is the Net/One PC System from Ungermann-Bass that enables a PC to achieve full connectivity to a host through the company's NIUPC, a single circuit board that plugs into one expansion slot on an IBM PC or compatible, essentially turning that PC into a network server.

"I think you're going to see a lot of co-operation between Lan and emulation board companies in the future," explains Ilene Goldman, program manager of the Workstation Market Program at IDC.

"Instead of re-inventing the wheel, Lan companies like Novell and others have been contracting with board makers to provide direct gateway service to a host from Lans.

Seymour Merrin of the Gartner Group

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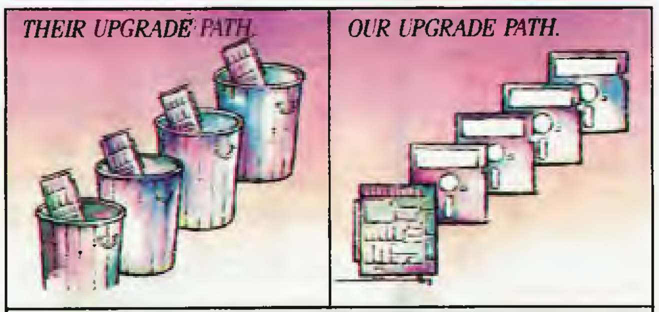

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Which left the users thirsty for more power. They wanted to interact with corporate data bases. Use multiple host sessions. Get into mainframe graphics. Do all this over the phone. Or from a LAN.

This involved other interests, like MIS, DP, PC evaluators and information centers. They needed more than boards. They needed a *system.*

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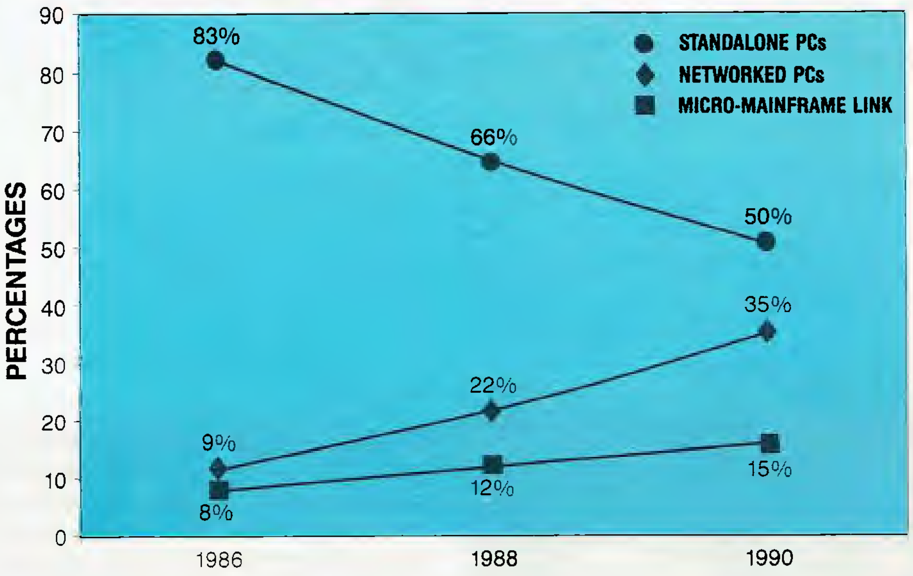
PC USAGE TRENDS IN AUSTRALIA—1986-1990



Trends in PC usage are expected to change in the next five years. Compass Research estimates that the number of PCs used as standalone devices will decrease by 33 per cent in the period between 1986 and 1990. On the other hand, the number of PCs being networked is expected to increase by 25 per cent. This is compared to a 7 per cent increase in direct micro-to-mainframe links. The number of PC networks connected to mainframes is yet to be determined.

That type of co-operation will increase," she said.

Merrin also sees Lan gateways growing in importance in the micro-to-mainframe market for economic reasons.

"Truly transparent link software can be written, but it would be too expensive and would slow sales considerably," Merrin said.

"There is an option, and that is placing the software on a file server in local area networks and providing a gateway to the mainframe. This would help spread software costs over a number micros on the network. I think it's the only way companies are going to be able to justify the growing prices of mainframe-based link software," he said.

Looming large over the field of micro-to-mainframe communications is the spectre of IBM's Advanced Program-to-Program Communications (APPC) LU6.2 communications protocol, which will eventually enable all systems on IBM's Systems Network Architecture (SNA) network to communicate directly with one another without the need of special software or hardware.

On the surface, LU6.2 would appear to make the lion's share of the micro-to-mainframe market obsolete. Not necessarily. While vendors are increasingly bringing out products supporting LU6.2, some analysts are predicting that APPC will not make a significant impact until the end of this decade.

"IBM hasn't laid out its APPC strategy yet, and we won't see full LU6.2 implementation until 1990," Goldman said.

"Even so, APPC is not automatically going to make the micro-to-mainframe industry obsolete.

> *'The entire link issue is becoming very important. Any company that makes it easy to give access to mainframe data and different operating environments is going to be ahead in this game.'*

"There will still be a huge after-market and installed base of users who will want to plug into LU6.2 after purchasing micros. PCs based on the Intel 80386 processors are not going to be providing LU6.2 right away. These 386 computer vendors will rely on board suppliers such as DCA and others to give them the LU6.2 connection," she said.

Until then, users are being confronted with an increasingly diverse range of micro-to-mainframe products. It is a big market, in large part made possible through the courtesy of IBM, which has left a legacy of heterogeneous operating environments that cannot speak with one another.

Integrated systems vendors like DEC, however, are not complaining. DEC, for one, has lately been feasting on IBM's lack of communications foresight. The company has been steadily stock-piling a series of links and gateways that tie IBM PCs into its Vax minicomputer environment and into IBM mainframes using the SNA network.

Other integrated systems vendors, such as Hewlett-Packard, Wang Laboratories, and Data General, are also putting more emphasis on micro-to-mainframe communications in their product strategies.

Explains Mike Gayowski, DEC's marketing manager for IBM connect products: "The entire link issue is becoming very important. Any company that makes it easy to give access to mainframe data and different operating environments is going to be ahead in this game."

- *Stan Kolodziej is US Computerworld Focus senior editor.*

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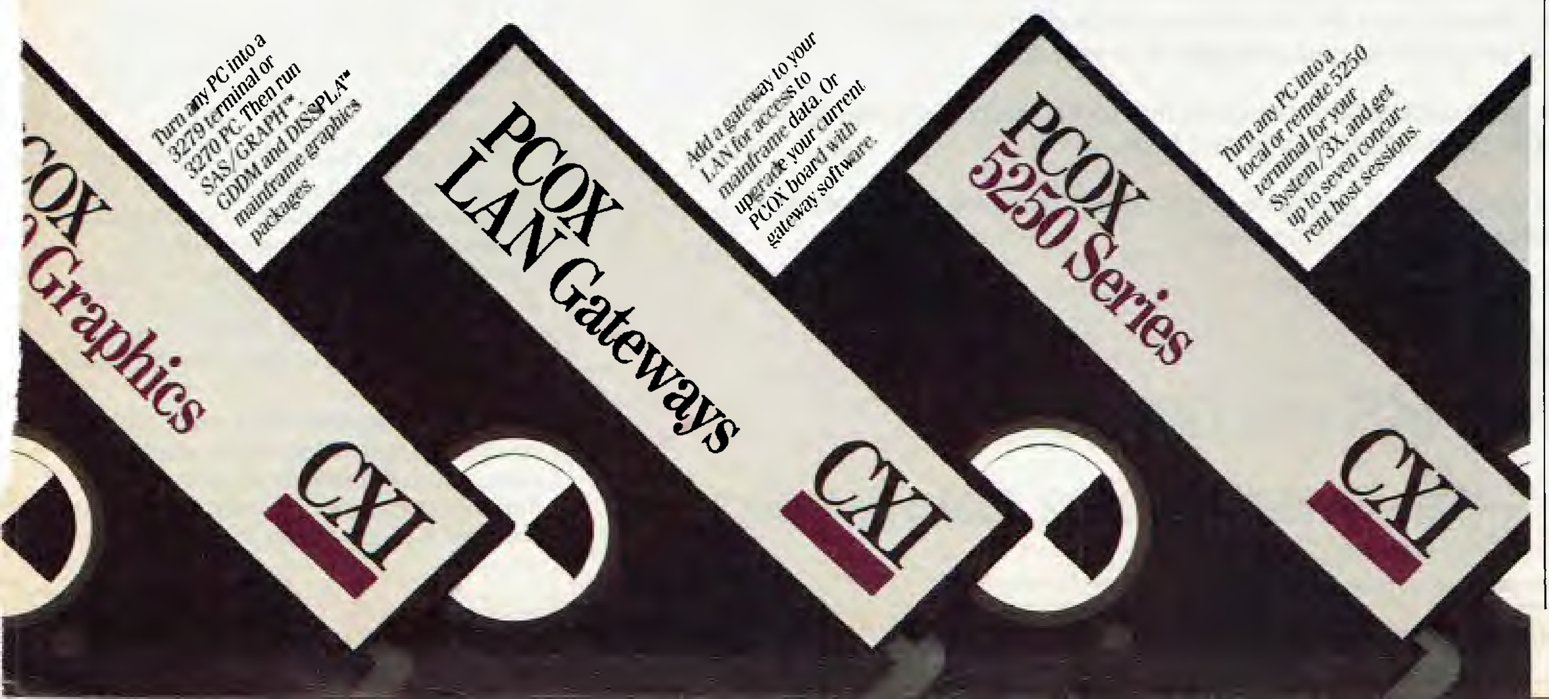
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Wise PC use gives businesses an edge

Peter Marwick (rear) and Ian Winchester.

Move helps Air New Zealand rocket back from heavy losses

By Martin Taylor

WHEN Ian Winchester, head of Air New Zealand's domestic capacity control, replaced a wad of computer printouts with an IBM PC, he did more than reduce the company's paper bill. "We believe we paid for the system within a week," he says. And the savings continue to top up the airline's bottom line.

The cost savings Winchester and his team are achieving come from more effective use of the airline's computerised information resource. Instead of a thick pile of difficult-to-digest, slow-to-arrive, computer printouts, they now tap into the company's mainframe through PCs and use their own microcomputer tools to analyse the mass of data.

"Air New Zealand has a strong commitment to enduser computing," said senior analyst Peter Marwick, who has been closely involved in the company's moves in this area. Air New Zealand's computing resource has played a key role in its recovery progam, after it experienced large losses culminating in the 1982 net loss of $NZ50 million — at the time, the largest in New Zealand history.

Its equally dramatic turnaround has seen the state-owned airline turn in a profit for each subsequent year, with the 1986 financial year showing a net profit of $NZ187 million, which makes it New Zealand's third most profitable corporation.

"More and more businesses are coming to realise that saving money is the same thing as earning money, and that if you can save more than your rival, it's the same as earning more than your rival," Air New Zealand computer and information systems manager John Englefield said.

Personal computers, mostly IBM, have been finding their way into Air New Zealand's operations for several years. The airline's primary system for general data processing is its IBM 3084 mainframe. About two years ago, the company purchased Tempus Link, a software package aimed at helping to simplify and manage access by microcomputers to its mainframe databases.

Melbourne's Distributed Data Processing Pty Ltd (DDP) supplied the package and support to Air New Zealand.

Peter Marwick: "Strong commitment to end-user computing."

Tempus Link software resides on both the mainframe and the personal computer. In conjuction with a hardware link, such as a 3278/9 emulation Irma card, it provides the user with a link to the mainframe. Its novel approach to achieving this lies in the use of virtual disks which reside on the mainframe, in "boxes" called virtual libraries. Each virtual library can contain up to 255 disks, which appear to the PC users as though they are normal disk drivers attached to the PC.

In the case of an IBM PC with floppy drives A and B and hard drive C, virtual disks would appear as D, E, F and G. Each can have up to 15M-bytes of MS-Dos file-compatible data.

Unlike terminal emulation utilities which expose users to the often-alien mainframe environment, Tempus Link lets users access the mainframe data using normal MS-Dos commands, or applications such as dBase III or Lotus 1-2-3. "That's the beauty of the concept," Marwick said. "The PC user just carries on as if there are extra drives on the PC."

Marwick has automated logon procedures to the mainframe, almost eliminating contact with the mainframe environment. Training time in micro-mainframe communications is claimed to be reduced to a few minutes.

(Continued page 18)

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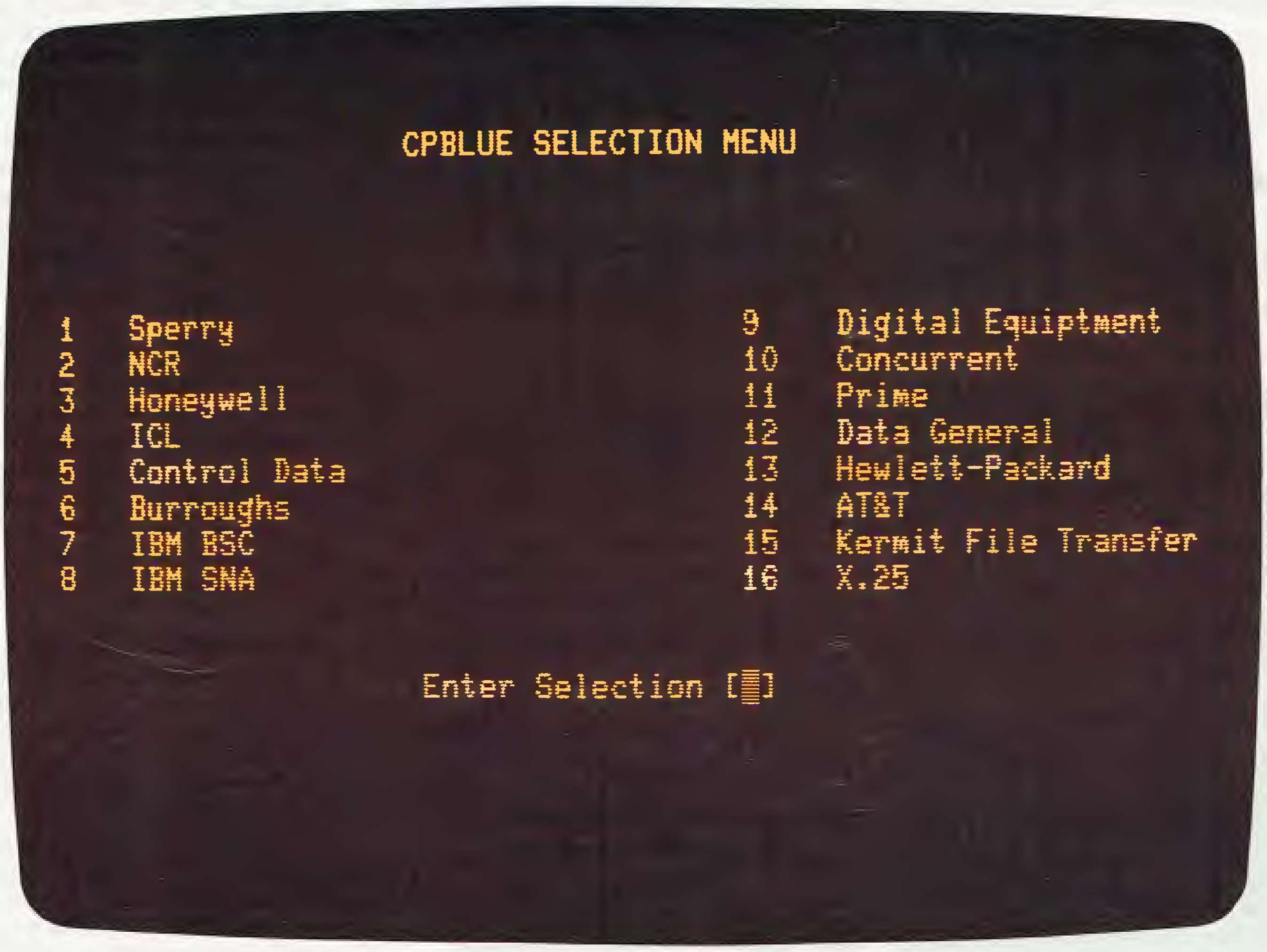

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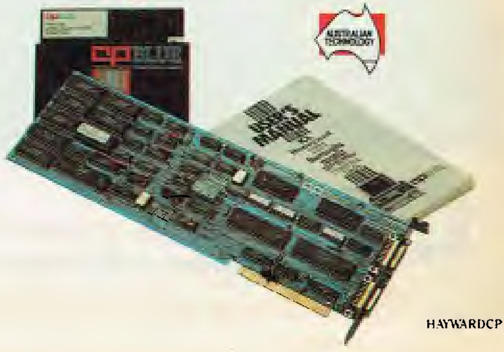

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HAYWARDCP108

Wise PC use gives businesses an edge

(Continued from page 16)

In the case of Winchester's system, in which the PC is used to interrogate the airline's forward bookings, relevant data from the mainframe is output to one of these virtual disks in the form of an ordinary text file. Previously, it had been output as a hardcopy report.

Winchester uses dBase III to generate his own range of reports to analyse the data. The flexibility of having his own report-generating capability has allowed him quickly to pick up potentially loss-making situations, many of which might previously have gone undetected.

In a business where crucial changes in bookings happen daily, the time taken to get answers has been reduced in many cases from weeks to minutes. "Previously it would take one or two weeks to get through 70 days of forward bookings. Now we ask questions and get answers back in 20 to 40 minutes," says Winchester. "It was difficult to react to changes in the market. This gives us the facility to react a lot more quickly."

Tempus Link also helps to manage the multitude of users on the system. Marwick is pleased with the security the system offers, which allows users to access only the data in their own Tempus Link-assigned areas, with password protection offered at the mainframe, virtual library and virtual disk levels.

"We can give the user a virtual disk of his own, provide him with a password, and he can do what he likes with it. He can manage the space as he pleases," says Marwick.

The data on which the user operates is a duplicate of the mainframe data, which is copied to virtual disk by the data processing department staff. Most users copy this data on to local storage before using it, which speeds up operation. Users can also initiate file transfers to the mainframe and other PCs and, indeed, to computers on the other side of the world.

'On balance we're winning. We've been able to give users that amount of facility because of the small amount of effort required.'

An important feature of this transfer, apart from its simplicity of operation, is that the files can be transmitted in their native format and used directly by programs such as Lotus 1-2-3. Air New Zealand uses this facility to send files to its London and other overseas offices.

While staying tight-lipped about the nature and use of the data sent, Marwick admits to the facility providing "significant cashflow benefits" for the company.

An innovative use of Tempus Link by Air New Zealand is in providing a bridge between two different communication systems.

The Ipars reservation system uses its own line protocol and operating system and teleprocessing monitor, peculiar to airlines. "Our airline schedule system is developed on the general data processing machine and has to be fed into the reservation system. We will do that through a PC," says Marwick.

Pressure off DP

Marwick says he is using Tempus Link's Application Program Interface (API) routines to provide the bridge. "With these subroutines, we can trap a message coming in from the reservation system, and convert it to a CICS-type message, and vice-versa," he says.

The increasing use of PCs by endusers to analyse mainframe data has had considerable effect on the data processing department. "It certainly takes a lot of pressure off us in terms of ad hoc reporting," says Marwick. "But this is offset by the additional demands users place for access to more information. The standard thing happens with PC users. They come to us and say 'Can we have that report in the form of a file, and we'll download it with Tempus Link and analyse it with Lotus 1-2-3'."

"On balance, though, we're winning. We've been able to give the users that amount of facility because of the small amount of effort required."

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Change lies in speed, power

By Tom Amos

UNIDIRECTIONAL telecommunication services have been dismissed in the mainstream of network application and design, banished from the earliest days to news wires and radio feeds.

Computers may have already changed all these traditional values and only recognition and an open mind are required to exploit new media and applications for the traditional host terminal link.

The traditional link composition between mainframe computers and the applications is becoming more difficult to define and more tenuous as time progresses. Fifteen years ago James Martin was telling us how to design multidrop telecommunications networks to support a variety of terminal and applications driven hardware on single lines.

Today we still optimise data networks around the same philosophy, trading off polling delays and throughput for an economical network design: the DP nightmare of uncontrolled communications in a controlled telecommunications world.

The scene has changed little, only the choice of services by which the applications may be connected. What has changed is the amount of power that is now being connected to that mainframe link. There is nothing new — minis of yesterday are called micros today, and the packages and controllers churn on, delivering more for lower.

Positive benefits

Stop and think about what has changed in those all too familar networks. Speed immediately comes to mind, more speed for lower cost. Better modems, DDS on, and increasingly digital transmission systems. Lower error rates, packet switching for itinerant use. All positive benefits, all predictable and all not changing the essential design philosophies of 15 years ago.

What has changed most in the telecommunications scene is not the delivery transmission system but the power of the computer on the terminal end of the line. More power in some cases than the mainframes which drove the multidrop networks back then. The harnessing of such power is probably where the first real advances in telecommunications will come in the next few years, a traditional area totally missed by users and carriers.

The combination of computer power and massive storage with selective broadcast services can provide time delayed, realtime telecommunication networks with vertical applications, which are not only more efficient than current thinking but also much more cost effective.

These services are not going to replace the genuine online transaction processing networks which require dedicated, low response time operation.

Predominantly, one-way information flow should logically be best served by an optimised communications system which functions in the same manner as the way the information flows.

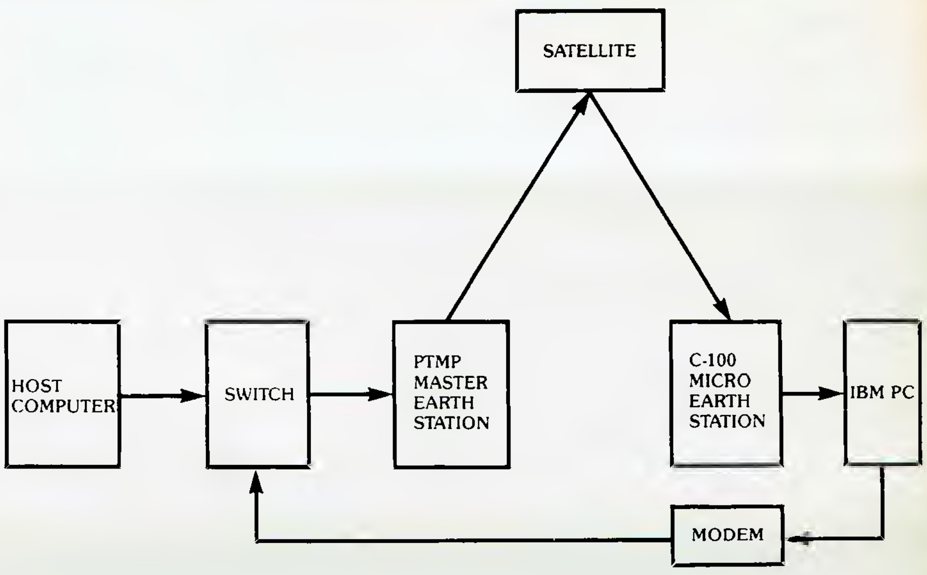
Little to no interest has been shown in Australia in unidirectional, selective recall distributed computer networks. As usual, those who can grasp the applications and the bottom line will be in good shape to exploit a new technology and the edge it could possibly bring.

Let me step you back a little to what communications and telecommunications is fundamentally all about before plunging headlong into the science and application of interactive data broadcast and voice broadcast networks.

The traditional forms of telecommunication have almost always assumed a two-way information flow. The humble voice discussion is an interaction between two or more parties communicating information in broadcast fashion between members of the group listening.

Contributions are made by members of the group as required, but with all hearing the total information flow. Telecommunications rarely allows the easy reconstruction of such real life mesh situations, as the technology traditionally has been point-to-point in nature rather than multipoint.

(Continued page 22)



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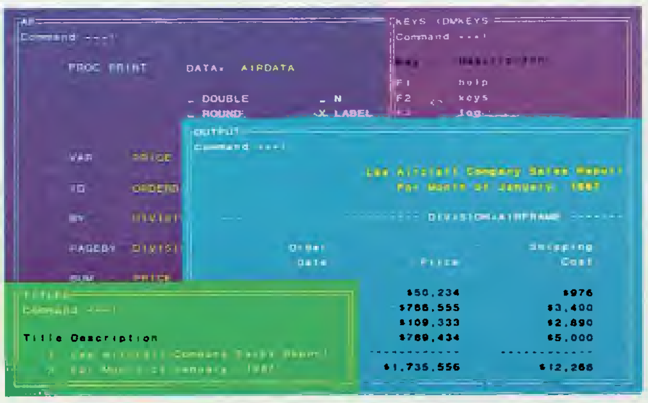


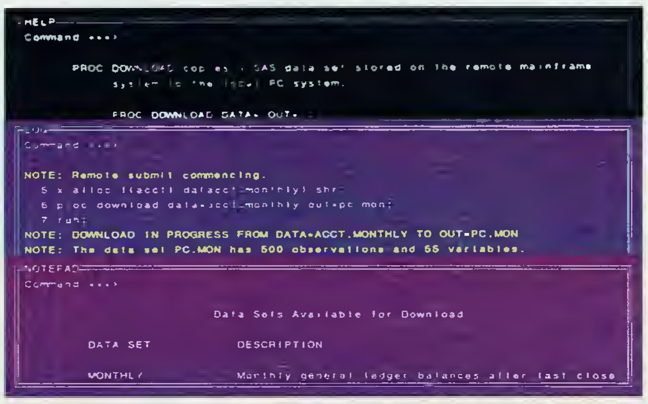
```
AF
Command ===>

     PROC PRINT      DATA= AIRDATA

                     _ DOUBLE          _ N
                     _ ROUND           X LABEL
```

```
KEYS (DMKEYS
Command ===>

F1        help
F2        keys
```

```
OUTPUT
Command ===>

                    Lee Aircraft Company Sales Report
                      For Month of January, 1987

                      DIVISION=AIRFRAME

         Order                               Shipping
          Date            Price                  Cost

                       $50,234                  $976
                      $786,555                $3,400
                      $109,333                $2,890
                      $789,434                $5,000
                    ----------            ----------
                    $1,735,556               $12,266
```

```
TITLES
Command ===>

Title Description
```

1 Ease of use. The SAS System has ready-to-use procedures for every kind of analysis and report—from simple to advanced, preformatted to customized. A built-in menu system and on-line help guide you through the procedures. Special windows let you define titles and footnotes for reports, check the characteristics of your data, change function key definitions, and keep notes.

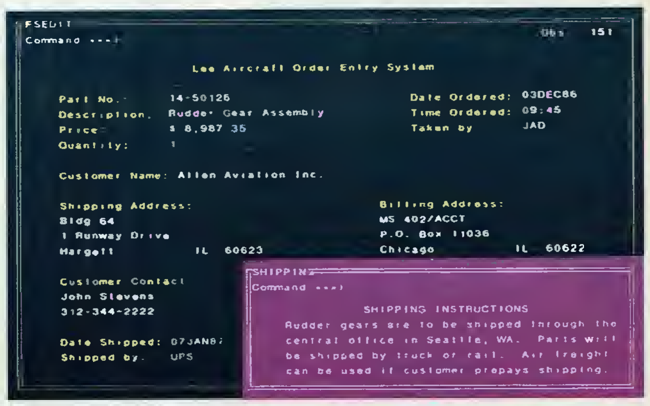


```
HELP
Command ===>

     PROC DOWNLOAD copies a SAS data set stored on the remote mainframe
          system to the local PC system.

          PROC DOWNLOAD DATA= OUT= ;
```

```
LOG
Command ===>

NOTE: Remote submit commencing.
  5 x alloc f(acct) da(acct.monthly) shr;
  6 proc download data=acct.monthly out=pc.mon;
  7 run;
NOTE: DOWNLOAD IN PROGRESS FROM DATA=ACCT.MONTHLY TO OUT=PC.MON
NOTE: The data set PC.MON has 500 observations and 55 variables.
```

```
NOTEPAD
Command ===>

                    Data Sets Available for Download

       DATA SET            DESCRIPTION

       MONTHLY             Monthly general ledger balances after last close
```

2 Connectivity. With the SAS System for personal computers, you get a built-in link to your host SAS System. You can download corporate data; develop, test, and run applications on your PC; or move data and applications back to the host for execution. Plus the SAS System reads data from any kind of file, including dBASEII® dBASEIII® and Lotus® 1-2-3®



```
FSEDIT
Command ===>                                                    Obs   151

                     Lee Aircraft Order Entry System

   Part No.:      14-50126                       Date Ordered:  03DEC86
   Description:   Rudder Gear Assembly           Time Ordered:  09:45
   Price:         $ 8,987 35                     Taken by       JAD
   Quantity:      1

   Customer Name: Allen Aviation Inc.

   Shipping Address:                          Billing Address:
   Bldg 64                                    MS 402/ACCT
   1 Runway Drive                             P.O. Box 11036
   Margett            IL   60623              Chicago           IL   60622

   Customer Contact
   John Stevens
   312-344-2222

   Date Shipped:  07JAN87
   Shipped by:    UPS
```

```
SHIPPING
Command ===>

                  SHIPPING INSTRUCTIONS
   Rudder gears are to be shipped through the
   central office in Seattle, WA.  Parts will
   be shipped by truck or rail.  Air freight
   can be used if customer prepays shipping.
```

3 Integration. The SAS System runs on mainframes, minicomputers, and personal computers so you only have to learn one software system no matter what hardware your company has installed. And as your needs grow, the SAS System grows with you. We're committed to supporting all the capabilities of our mainframe software system for your PC. Whether you license one product or several, you'll enjoy the same high-quality software, training, documentation, and support we've offered for 10 years. It's all part of our site licensing plan.

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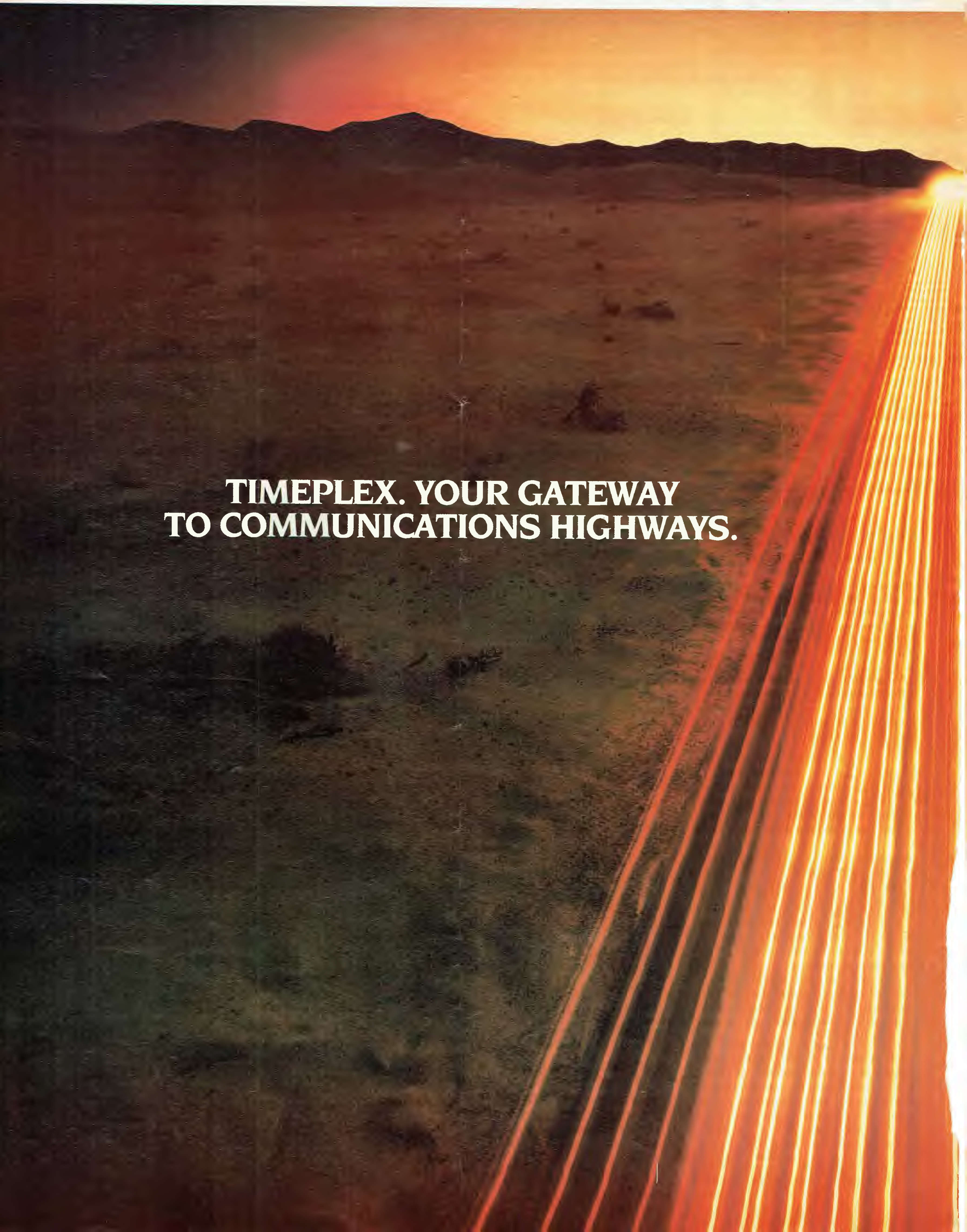

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Timeplex®

INTEGRATED COMMUNICATIONS SYSTEMS

Keys to change are speed, power

(Continued from page 19)

The limitations in application due to the technological restrictions, and in some cases the erection of artificial barriers, have resulted in modern communications being based on the traditional technologies rather than a natural development in applications spurring the development of a new technology.

Wide area data broadcast is by historical standards a new service to Australia.

Fundamental limitations, particularly in Australia, have arisen from the maintenance of monopolies for the electronic extension of services outside the ring of people communicating in the example above. Solutions, where price is not the major consideration, have been developed within the scope and bounds of the traditional point-to-point terrestrial services, just as Martin suggested all that time ago.

Elsewhere, technology is producing some really remarkable vertical solutions to problems it seemed in Martin's time too hard to solve. It is hoped that a wider perspective on what is possible with modern technology will produce applications which define the broadcast technologies unlocked by radio and satellite technologies.

Closer to home, the late entry of Australia into the satellite world closely parallels other such feats as the regulation of information content and the policing of spectrum until the last few years of the "good of Australia" philosophy and rules. The same bureaucrats who have hindered application driven communication development have also been responsible for the somewhat ill-fated semi DBS Bmac system which has been the first broadcast point to multipoint satellite system introduced in Australia.

Overseas, the unlocking of communication capacity by the use of broadcast capacity has resulted in new applications which were once traditionally supplied by two way point-to-point telecommunications services. New technologies which are just starting in Australia have been in use elsewhere providing solutions for many years.

These technologies are generally radio based and provide broadcast bandwidth with selective addressing to the receiver for information flow. The applications which can be converted from two-way to essentially a one-way information flow are the areas we concentrate on for the applications in office information distribution.

The combination, particularly in the data area of one way information flow systems with optical disk and PC power, allows the one way system, with suitable software, to effectively perform as a two-way system as seen by the user.

Most DP people are horrified at this suggestion as the blinkers are as difficult to remove as the Acks and Naks. Consider database distribution, manuals, service bulletins, news, mail and facsimile — all basic information distribution functions that can be more effective if designed to utilise a predominantly one-way system to provide the information dissemination path.

Traditional screen controller situations can to some extent be moved closer out to the application by the tiering of memory throughout the system. After all, these types of application are predominantly an information flow in one direction. Optimisation, delayed dial-in updates may be much more cost effective than a symmetrical multidrop leased line system.

And what of this magical solution? It does in fact exist in Australia today and is used for other, more mundane applications. The applicable new-wave technologies are diverse and range from simple subcarrier transmission systems to satellite-based services which can cover the whole of Australia for a single fee.

All the new services have one common element, they use radio technology in some way to broadcast encoded and addressed information to the tuned-in receivers. Most services are secure from eavesdroppers and either cover a single area or extended integrated country coverage. You pay for what you get.

> *'Most services are secure from eavesdroppers and either cover a single area or extended integrated country coverage. You pay for what you get.'*

A few points to cover the introduction to a new way of providing a telecommunications service for a corporation. Most readers will not have encountered the terms used before and a brief explanation follows:

Paging — a familiar service which now covers most major Australian cities and extends low rate data, text and voice messages to cheap pocket receivers.

SCA — sub carrier authorisation data or voice transmission up to 64K-bits/sec on an FM or TV transmitter (SMT alternate name).

MDS — multipoint distribution service for microwave radio broadcast of data, voice and image, a current service provided privately in Australia.

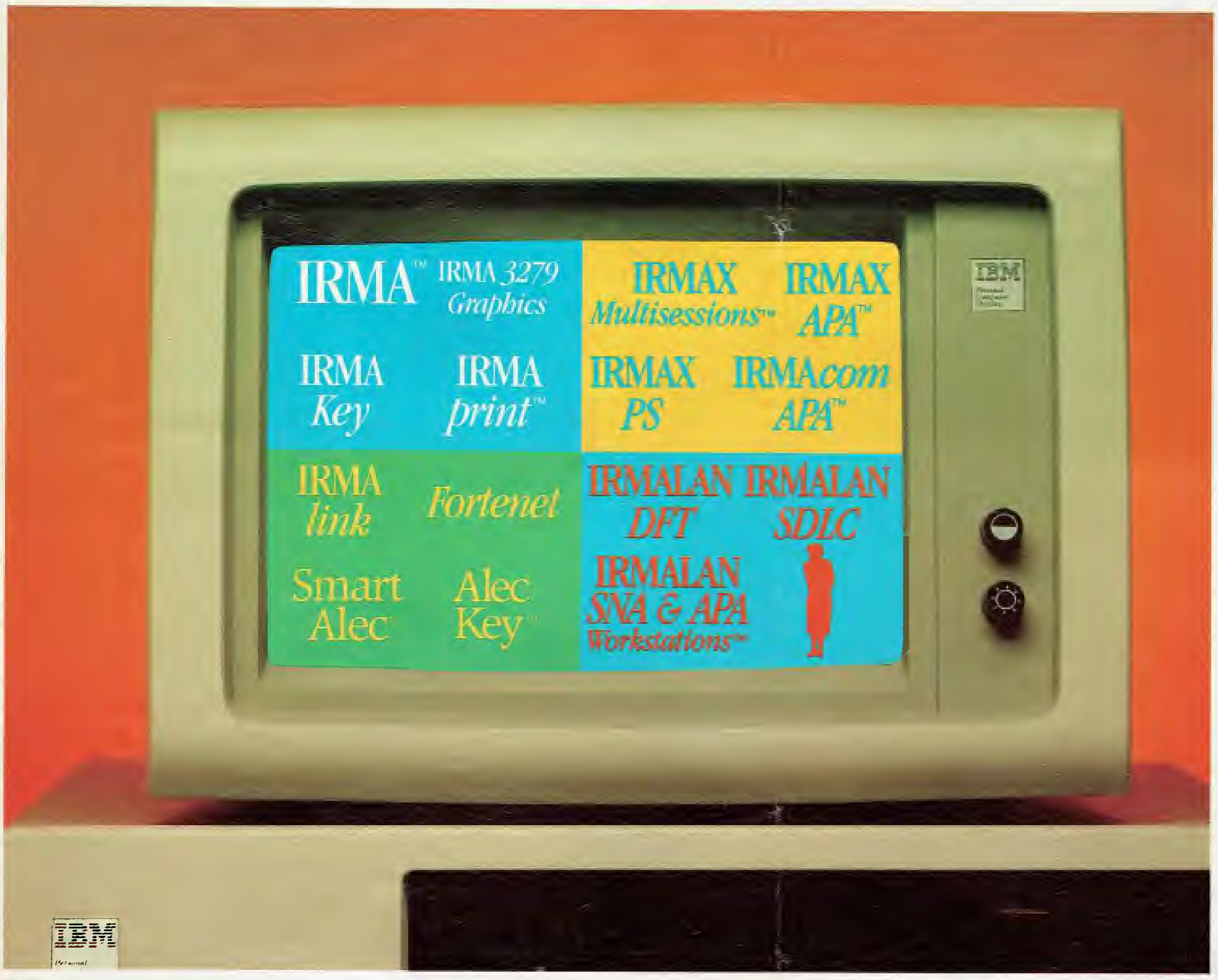
PTMP — point to multipoint satellite data, voice and image addressable services.

The range of terminal equipment prices to receive a one-way medium to high-speed service extends from several hundred dollars for a city based SCA (SMT) type service to over $A50,000 for a high-speed broadcast trunk receiver. The basic satellite solutions start at around $A3500.

Vertical service providers, within the scope of the current legislation, are already operating in the Australian market, more are about to follow. In the US and Europe, services are well established in the financial, betting, news and database areas with vertical corporate applications continually being discovered and developed.

Some of these new services are being introduced today by private corporations to solve particular needs and applications.

By the end of 1987 some powerful alternatives for specialised problems will be in place. It is then up to you, the potential user, to go the next step.



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S035FPC

Inexpensive, versatile — but which options are real imperatives for you?

Personal computers can offer a lot of versatility when connected to mainframes. Rob Rohrlach examines the factors which must be considered in design of a universal micro-mainframe link board and outlines the capabilities of state-of-the-art software technology.

THE TRADITIONAL organisation of a major computing resource consists of a mainframe computer system connected to a population of terminals. The terminals are specialised devices which communicate using a particular protocol, usually peculiar to the brand of mainframe being used. Personal computers have brought a new possibility into the system — the connection of PC to mainframe. There are a number of attractions to this scheme:

- A PC is becoming cheaper than a specialised terminal
- The PC can still be used for other tasks when not communicating with the mainframe (whereas a specialisted terminal can do nothing else)
- A PC provides economical distributed processing
- In many cases PCs are already in the organisation
- It should be possible to make one PC talk to different brands of mainframe
- Staff with PCs at home can be given access to their organisation's mainframe, thus improving productivity and providing the means of working at home.

The task of connecting a PC to a mainframe is not a trivial one, and involves several considerations. In fact, the problem is the design of a network for interconnection of different brands of computing equipment. To be really useful a PC-to-mainframe product should provide the capability to connect to a wide range of mainframes and emulate a wide range of terminals.

Plentiful protocols

Protocol emulation is the first requirement. This involves a two-way translation of data so that the PC appears to be a device native to the mainframe. There are many different protocols in use, most being proprietary systems from manufacturers such as Unisys, Control Data, Honeywell, IBM, ICL, and others.

Within many of the protocols there are different parameters. So a link product needs the ability to configure these parameters to suit particular situations. This sort of flexibility can be provided in software.

The second major requirement is terminal emulation, which is not the same as protocol emulation. A truly universal micro-to-mainframe link product allows the PC to act as if it is a specialised data terminal. This means incorporating facilities for emulating the screen presentation services of such a terminal, and providing the special keyboard commands and functions which go with it.

Terminal emulation need not be tied to protocol emulation, and there are advantages in being able to mix and match. So the PC should be able to emulate the terminal of one manufacturer while communicating with the mainframe of a different manufacturer, if necessary.

The ability to talk to a mainframe and emulate a terminal is obviously very useful, but a PC offers the potential to do more than this.

File transfer is a valuable capability which can be offered. This means that files can be sent from a mainframe to a PC and stored on disk in MS/Dos format at the PC end. Transfer in the other direction is also required. To achieve this, the mainframe needs a compatible file transfer system;

(Continued page 24)

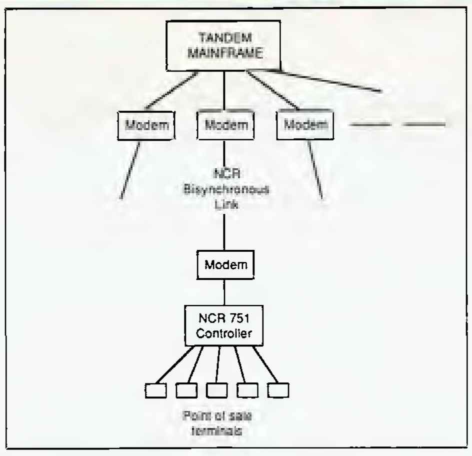

Figure 1 Original arrangement

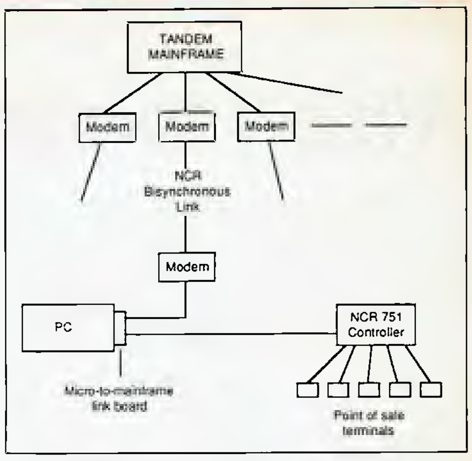

Figure 2 Final arrangement

Each store requires a low-cost PC running the store-based part of the management software, and the company needs to connect these to the host network to complete the system. Although a communications program could have achieved this, it would not be able to coexist with the bisynchronous link to the 751 units. Thus, that solution would entail either a separate link for each PC or the use of multiplexing techniques on the existing links. Both alternatives are expensive. A micro-to-mainframe link board in each PC achieves the required result by using the arrangement shown in figure 2. The PC and the 751 are each given a logical address, and the link board automatically passes mainframe traffic to and from the 751. This solution requires only a board in each PC and is the most cost-effecive method. The system has the added advantage of providing tightly coupled links between applications programs running in the PCs and the mainframe, while still allowing independent addressing between the mainframe and the PC and 751 controller at each location.

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Which technical options are really imperative?

(Continued from page 23)

either a general utility such as Kermit, or a proprietary remote job entry (RJE) facility. File transfer is essentially a batch process.

Once a file has been captured by the PC it is available to any PC application program which is able to use it. Also, once the file has been updated or changed, it can be sent back to the host. This opens up all sorts of possibilities for the sharing and distributed processing of central records.

To go one step further, a micro-to-mainframe link product could be set up to act as an MS-Dos callable device. This would allow modifying of applications programs in a PC, able to communicate directly with applications programs in the mainframe. In this case the link would be transparent to the applications as it handled the protocol conversions.

By allowing multiple virtual circuits on a link, the power of programs such as MS-Windows can be fully utilised.

A practical approach to meeting these requirements is a plug-in board carrying ports for connection to the mainframes, either directly or via modem. As well as performing these functions, certain other design features would seem to be desirable for a universal micro-to-mainframe board.

Incorporation of an onboard microprocessor and local memory to handle all the communications activity would avoid loading the CPU in the PC. This also opens up the possibilities for greater flexibility.

As data communication is a changing environment and every network is different, it would be advantageous to have all the actual emulation data on disk for downloading configurations to the board. In this way, updates could be incorporated simply via software on disk.

By having the board under independent control, it is possible to include the capability of switching between host sessions and MS-Dos while maintaining the links. So a user could have concurrent sessions with two different hosts and switch between them and the operating system at will. The links would not be broken until the sessions were logged off.

We can now assemble a list of desirable features for a micro-to-mainframe link board:

- A variety of common protocol emulations with variable parameters
- A variety of terminal emulations
- Independent protocol and terminal emulations
- File transfer ability
- User MS/Dos interface
- Two or more ports
- Concurrent sessions to different hosts
- Ability to switch between hosts and/or MS-Dos.
- Emulation data downloaded from disk
- No communications load on the PC

Products with such features are now commercially available, opening up a wide range of possibilities for the inclusion of PCs in computer networks.

The following case study illustrates the application of a micro-to-mainframe link board in solving a problem in a large network.

A large retail store chain has a Tandem host computing running store management software, with NCR bisynchronous links to individual stores. The link at each of 135 stores terminates at an NCR 751 controller which is wired to several point of sale terminals.

Each store requires a low-cost PC running the store-based part of the management software, and the company needs to connect these to the host network to complete the system. Although a communicatons program could have achieved this, it would not be able to co-exist with the bisynchronous link to the 751 units. Thus, that solution would entail either a separate link for each PC or the use of multiplexing techniques on existing links Both alternatives are expensive.

> *‘It is a fair assumption that these products will have a profound effect on the efficiency and productitivy of organisations.’*

A micro-to-mainframe link board in each PC achieves the required result by using another arrangement, whereby the PC and the 751 are each given a logical address, and the link board automatically passes mainframe traffic to and from the 751. This solution requires only a board in each PC and is the most cost-effective method.

The system has the added advantage of providing tightly coupled links between applications programs running in the PCs and the mainframe, while still allowing independent addressing between the mainframe and the PC and 751 controller at each location.

To summarise, we have seen that a well designed micro-to-mainframe link board can greatly increase the versatility of a personal computer by given it access to a variety of mainframes together with the ability to emulate a number of different types of terminal. Such a product can also offer file transfer capability and may be used as a transparent link between applications programs running on mainframes and PCs (with suitable modifications to those programs).

The many benefits of micro-to mainframe links are now being realised, and it is a fair assumption that these products will have a profound effect on the efficiency and productivity of organisations which take advantage of them.

• Rob Rohrlach is general manager of Computer Protocol, which developed the CPBlue universal micro-to-mainframe link board.

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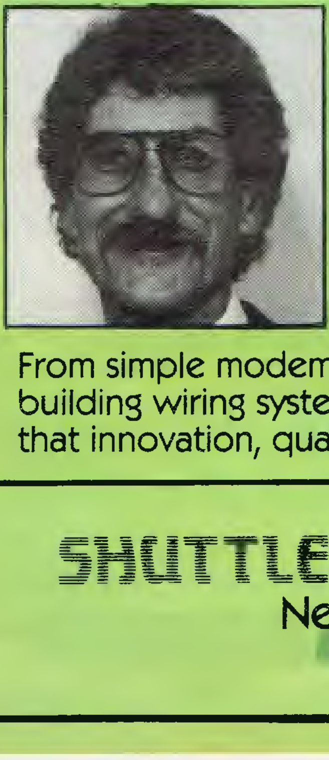

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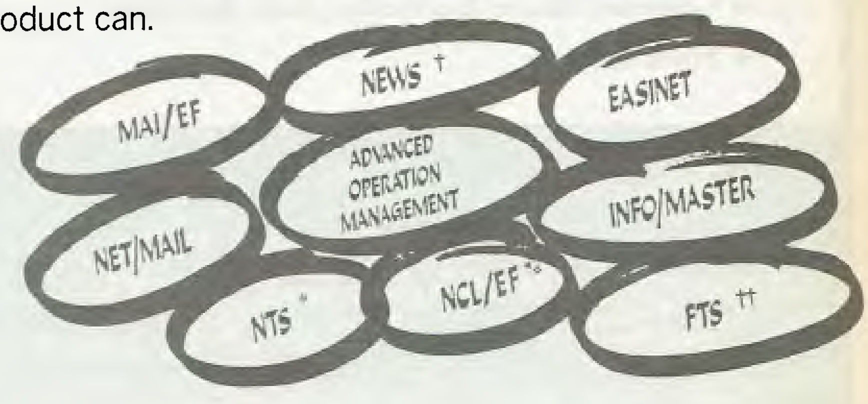

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Universal workstation approach

Wise managers will provide a seamless high-speed interface

By Philip Mellett

GETTING one computer to communicate with another is not really such a difficult task. After all, provided that each has a hardware communications port and each uses a defined protocol, then a reasonably smart communications design engineer should be able to produce a black box or a card, probably write a clever piece of software for one or both machines, and — hey presto — the job's done.

However, the real question our designer should ask himself once the product is complete is: "What have I actually achieved?"

If the equation turns out to involve no more than the dollars saved in hardware acquisition costs and the dollars gained in productivity benefits for specific point-to-point applications, then the answer to the question is "Not much".

The effectiveness of any communications product — hardware or software — must be measured not only by whether or not it solves the immediate problem at hand, but also by its usefulness as a generalised tool to help solve the problems of tomorrow, should they arise. And arise they most certainly will.

As corporate computer users find PCs invading offices and workplaces where their presence would have been unthought of five years ago, the simple Irma-type point-to-point solution for allowing these devices to communicate with the mainframe becomes ineffective. One problem has simply been substituted for another.

Once one PC user has justified access to the mainframe, you will find another with similar needs. Once you have two, you will find half a dozen more, and so on.

The point to emphasise is that once you have made your first point-to-point connection, you have a network. You must, therefore, make plans at **that** stage for managing the growth of that network in an orderly fashion.

Your initial requirement may have been to connect one PC to (say) an IBM mainframe. But that single PC will eventually become a cluster, and the cluster will have networking needs of its own. In addition, you may well have an asynchronous minicomputer such as a Vax doing specialised work in a technical department. Can you guarantee that in the future your PC users will be unable to justify access to that?

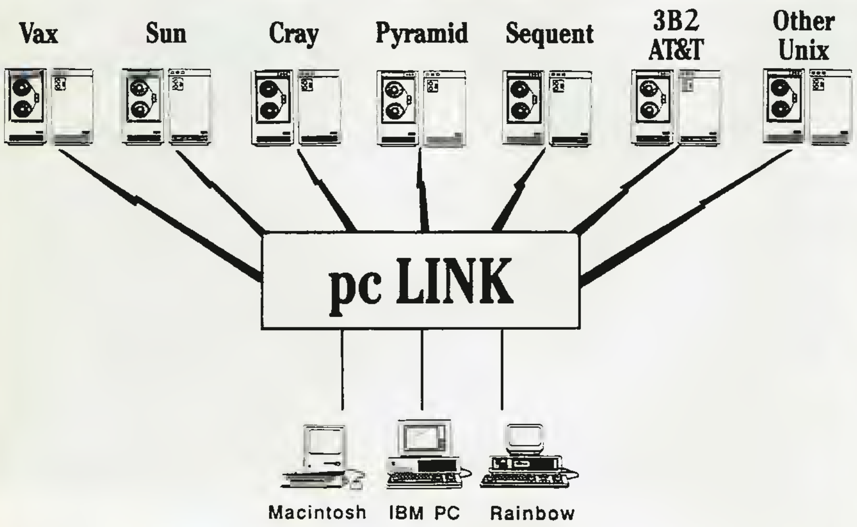
Is there an approach which will provide a general purpose solution to all these potential needs, while remaining simple in concept and avoiding a proliferation of black boxes, add-on cards and a spaghetti junction of switches?

Fortunately, the answer is yes!

If we stop considering the problem as one of connecting two essentially incompatible devices together, and instead conceive a single standard interface with which

Philip Mellett

> ***'Conceive a single standard interface with which each device may communicate and essentially the problem is halved.'***



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each device may communicate, then essentially the problem is halved.

Fortunately, over the past two years or so, that standard interface has become a practical reality with the publication of the IEEE 802 series of standards (covering Ethernet, token ring and token bus technologies), and the general industry acceptance of the Open Systems Interconnect (OSI) Reference Model produced by the International Standards Organisation.

So, if we use as our standard interface a general purpose local area network (Lan) built to these standards, with intelligence and control mechanisms of its own, our problem is reduced by a further order of magnitude.

An example of such a solution is provided by the Net/One Lan from Ungermann-Bass. This enables any IBM PC or clone, with the addition of only one add-on card and one RS-232 connection, to become a truly universal workstation. It can communicate with an IBM host, which will see it as just another 3270 terminal; it can share the resources of its local cluster, which can include file and printer servers as well as other PCs; it can access a DEC Vax; and by passing across bridges can communicate with devices connected to other Lans, either Ethernet or token ring.

What is more, the personal connection software in the PC will allow the user to display the results of all this separate activity simultaneously in separate windows on the PC. Data from the windows can then be edited, cut and pasted, reformatted and then electronically mailed off at high speed to other destinations altogether — whether local or remote.

Thus the PC and its single network interface unit (NIU) card become in effect a universal workstation capable of performing the functions of a 3270 terminal, an asynchronous terminal, a remote processor, a file server in a local cluster or, of course, a free-standing PC.

> *‘The fact that one NIU card replaces an Irma card, a serial port and a network card in each PC removes the problems associated with getting all the software to co-operate satisfactorily.’*

This universal workstation approach makes very good sense from a resources management point of view. Network management is a function performed by the Lan and is completely transparent to the application programs in individual computers. Different protocols and data speeds are automatically catered for by the standard interface presented by the NIU.

The resources required to manage the accessibility of data may be managed as a separate issue from those resources required to actually process that data at individual locations.

The solution offers an inbuilt flexibility which is essential to manage growth in demand for communications services as PCs proliferate throughout an organisation.

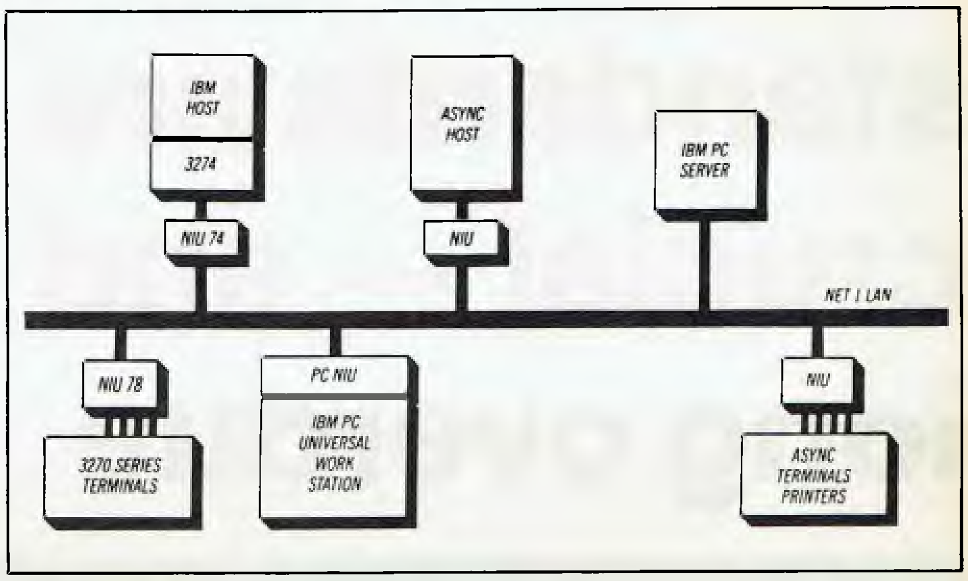
The practical benefits of this approach in terms of dollars saved or productivity gained can also be quite considerable.

The fact that one NIU card replaces (say) an Irma card, a serial port and a network card in each PC is not only a cheaper solution but removes the problems associated with getting all the software to co-operate satisfactorily.

At a recent conference, the consensus was that the cost of physically relocating a terminal or PC connected with coaxial cable was about $A1500. Using RS-232C or twisted pair, the costs were significantly lower.

Any individual PC user, with his necessarily limited view of the corporate database, sees his requirement as simply that of providing a link between his machine and one or more others. The wise information services manager will today respond to that need by providing a single seamless high-speed interface between the three main functional types of devices in the corporate environment — networked PCs, asynchronous minicomputers and IBM host mainframes.

- *Philip Mellett is managing director of Data Bridge Electronics Communications Pty Ltd.*



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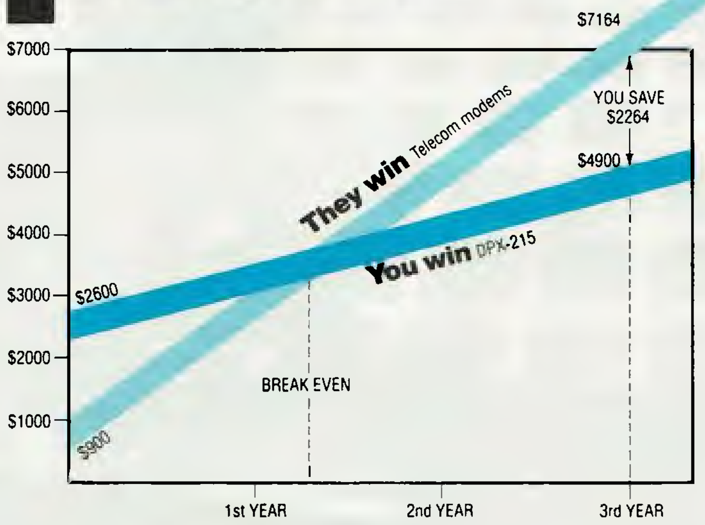

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True Cad/Cam standards are crucial — and long overdue

Communicating a message when the message is an image can pose great problems in time-critical industrial applications. While such vital transmissions are now governed by a multiplicity of evolving standards, which themselves are not compatible, there is at last a welcome move afoot to integrate the diverse and often ill-defined graphics interchange protocols. Joel Orr explains.

WHOEVER said: "A picture is worth a thousand words," never tried to digitise one. Digital files of engineering drawings frequently run to hundreds of thousands of bytes. Computer-aided design and drafting and computer-aided manufacturing networks (Cadd/Cam) must have the bandwidth to accommodate such volumes, but bandwidth is only part of the challenge.

The greatest problem faced by users is format incompatibility among different systems, which, in terms of the Open Systems Interconnect (OSI) model, translates to presentation layer incompatibility. Because each Cadd/Cam vendor has created its own format, organisations that have different Cadd/Cam systems cannot exchange data.

Cadd and Cam data differ from most data processing information in that they describe pictures. The format is invariably that of vectors, rather than of raster lines that are used to form television and facsimile images.

In three-dimensional Cadd systems, methods for representing surfaces and solids are even more varied than those used for two-dimensional geometry. Numbers that correspond to the X, Y and Z coordinates of points in space are arranged to describe points, lines, surfaces or solids. Additionally, nongraphic information, such as that used for bills of materials, may also be included. This diversity makes translation among different formats difficult.

In the Cam environment, geometry, text, machine-dependent sensory systems, and robot and machine tool instructions constitute the data that must be handled on the network. There is integration of computer-based operations toward closed-loop systems — systems that contain feedback mechanisms by which devices monitor the effects of their actions on other devices. For robots and sensory systems, data transfer is often time-critical, within as few as 100 milliseconds.

> *"The greatest problem faced by users is format incompatibility"*

In robots that incorporate vision systems, for example, the information from cameras and sensors must reach the machines that process it quickly, so that signals for controlling the motions of the robot can be sent back to it in time to be useful.

Because Cam systems often generate a continuous stream of data and control signals, data transfer bandwidth requirements are high and are getting even higher. In the future, most time critical data will flow among the data-collection devices such as sensors, effectors and local-controllers, and only summary data and general instructions will move out of the controller on to the network. But for now, many applications are demanding more computing power and more high-speed co-ordination than can be effected locally. These require time-critical communications over the network.

The simplest solution to the data compatibility problem for both Cadd and Cam is for a user company to buy all its systems from the same vendor. Because no vendor has the best of everything, users often turn to direct translation programs for translating data between different vendors' systems. Direct translation programs are appealing in concept but are difficult to implement because they may function properly only for a particular release of the vendor's software. In addition, the programs may have to be modified with each new release.

During its automation planning process, General Motors (GM) discovered in 1980

Cad/Cam standards are crucial

that more and more of its factory devices were acquiring computer-based controls. Long-term budgetary analyses revealed that more than half of the projected expenditures on automation were required to pay for interfaces at various levels.

This led to GM's decision to define a manufacturing automation protocol (Map) based on the International Standards Organisation (ISO) OSI model, for communications among the diverse control devices. Map's primary application is in Cam.

GM announced at the Autofact '86 show that by specifying a standard networking protocol for factory environments, it expects to reduce the cost and complexity of its automation efforts in the long run.

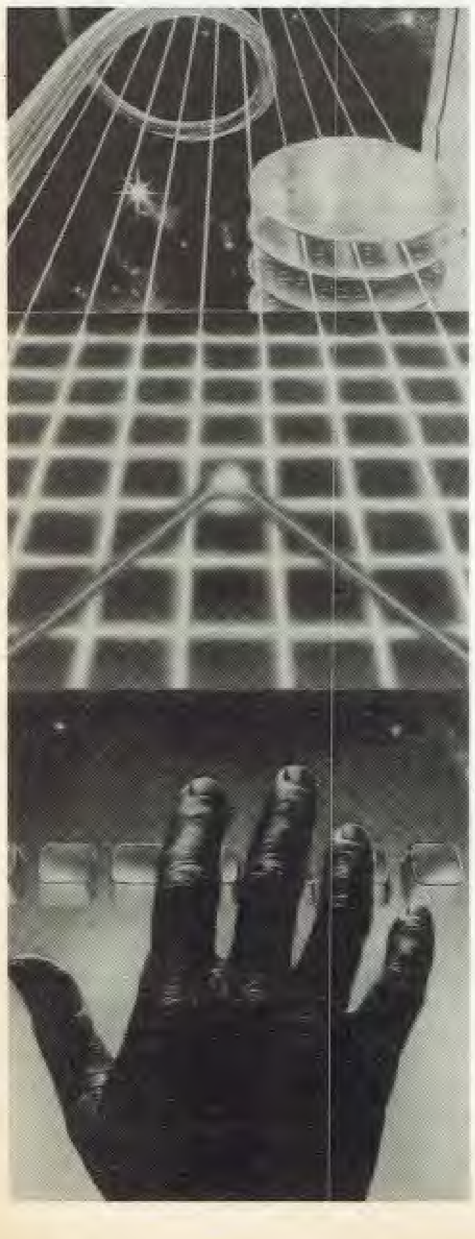
Because Map uses the token ring network access control method, its worst-case response times are predictable. This makes Map suited to factory environments, in which it is essential to manage communication times.

But Map is expensive, especially in time-critical configurations. In addition, the Map committee and its subcommittees seem to be moving at a snail's pace, and agreement on many of the myriad details has been elusive.

Because of the need for high-performance communications in engineering environments, Boeing decided to implement a standard called technical and office protocol (Top). Top is a carrier-sense/collision detection implementation of the ISO/OSI model that is principally used for Cadd applications.

This approach to communications permits greater burst bandwidths at lower connect costs than token rings. However, its worst-case response times are not predictable. In a technical office environment, this consequence is small, but on the shop floor it renders Top useless.

Top and Map resolve certain aspects of Cadd and Cam networking, but they do not deal with format compatibility issues.



Boeing and GM each struggled with primary Cadd/Camm networking problems: the interconnection of workstations and the transfer of Cadd and Cam data. Workstation connectivity is a greater challenge in the Cadd/Cam environment because Cadd files are typically large and response time is critical.

There is a mitigating trend, however. When Cadd systems consisted largely of unintelligent graphic displays connected to a central computer, each operation that repainted the screen called for a transfer of the entire file, or a significant portion of it.

Today, almost all Cadd/systems have graphic editing that is entirely local to an intelligent workstation. Thus, the large files need be moved only at the beginning and end of the work session. The need for large-bandwidth communications in engineering has, therefore, been reduced.

Map and Top are not the only standards of concern to manufacturing network designers. There are several graphics standards that do not directly help Cadd/Cam users with networking issues. But when application software supports them, and workstations have some of their functions built-in, the graphics standards could result in a somewhat lower volume of network traffic.

■ Computer Graphics Interface (CGI): The ISO is working on a draft of this standard, which is modelled after Ansi's Computer Graphics-Virtual Device Interface. This is a programming standard focusing on ways to normalise the program interface to various I/O devices, primarily in interactive applications. It does not support "segments", or graphical programming features available in some graphics hardware.

■ Computer Graphics Metafile (CGM): To pass graphic information from one program to another, a well-defined standard format is necessary. CGM describes such a format and was intended to complement CGI in hard copy and batch operations. It provides, essentially, a "snapshot" capability, which CGM achieved from the level of an ISO draft international standard. CGM is not for transfer of Cadd data, which contains much more information than metafile data and is generally application-dependent.

■ Graphics Kernel System (GLS): This standard, which has been approved by Ansi as well as ISO, is used in computer graphics programming. It describes formats for geometry and text in graphical files. However, it is nonhierarchical in that each graphic object must be explicitly represented.

■ North American Presentation Level Protocol Standard. Pictures are the subject of this Ansi standard, but it is geared primarily toward videotex applications with relatively low resolution. Therefore, it is not applicable to Cadd.

■ Programmers Hierarchical Interactive Graphics Standard: Another programming standard under development by ISO, it is designed to remedy the lack of hierarchy in the GKS. Hierarchical structure means that instances of a graphic object can be used, so that it is not necessary to represent each object explicitly. Lack of complete definition has slowed the spread of this standard.

Cadd and Cam impose heavy bandwidth demands on networks, and the present proliferation of different Cadd/Cam data formats further complicates matters. Standards, such as Top for Cadd, and Map for Cam, will contribute much to the resolution of the problems of connecting multivendor systems. Initial graphics exchange specification (Iges) is targeting the data compatibility problem.

All that is needed now to complete the picture is a little co-operation among Cadd/Cam vendors.

That may be a long time coming, however, if users do not take the initiative and insist their Cadd/Cam vendors actively support evolving stanards.

● *Joel Orr is chairman and principal consultant of Orr Associates Inc, an industrial automation consulting company.*

How Boeing has tackled the problem of incompatibility

THE Boeing Co has been involved in Cadd/Cam since the technology became commercially available in the early 1960s. Boeing's Cadd/Cam systems enhanced engineering and manufacturing productivity significantly from the outset, but the number of users was small because each workstation, or "seat", cost hundreds of thousands of dollars.

By the end of the 1970s, Boeing's cost per Cadd seat had dropped to about $US110,000. Productivity improvements in drafting alone justified the acquisition of dozens of workstations, but different Boeing divisions selected Cadd/Cam systems from different vendors, principally, Computervision Corp, Gerber Scientific Inc and Control Data Corp. The need arose to exchange engineering data among the systems, but vendors were reluctant to reveal the structure of their files to Boeing programmers.

William Beeby, a consultant to Boeing and former data processing manager at Boeing, says even if translators could be written, there is no guarantee that subsequent versions of the Cadd/Cam system vendors' software would support the old formats.

In its first attempt to solve the Cadd incompatibility problem, Boeing tried to develop its own neutral database formats so that data from any one of its systems could be converted for use on another. When substantial investment in these efforts failed to produce the desired results, Boeing joined forces with General Electric and the National Bureau of Standards in 1979 to create the Iges. This is a neutral format for Cadd, not the format of any commercial Cadd system.

To translate data from one Cadd system to another, vendors need only provide translators from their proprietary formats into and out of Iges. File translations can then be effected by converting one system's file into Iges using the translator supplied by that vendor, and then converting from Iges into another system's format using the second system's Iges translator.

Almost all translators out of Iges, or postprocessors, work well. Many vendors, however, have produced poor preprocessors, because they do not want to make it easy for customers to convert their data for use on other systems.

Iges deals only with geometry. There are many other types of design-related information that it does not cover. A number of Iges users are developing a standard called part data exchange specification (Pdes), which includes non-graphic as well as graphic information. Pdes is at least a year away from completion and is expected to subsume Iges.

In short, Iges makes it possible to convert drawings from one Cadd system to another — but it does not make it easy.

> *“Agreement on many of the original details has been elusive”*

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Timeplex's Link/2 doubles voice channel capacity

NORTH SYDNEY — A data and voice facilities management system designed to integrate a digital PBX into a communications network has been announced by Timeplex Australia Pty Ltd, the recently formed subsidiary of US communications specialist Timeplex Inc.

A spokeswoman said Link/2 accepts digital input directly from PBXs formatted with 32 64K-bits/sec time slots, and treats the information as it does any other information stream, with compression, routing, bypass and diagnostic functions all fully supported.

The data stream from the digital PBX is formatted in 32 channels, and each voice channel can be compressed from 64K-bits/sec pulse code modulation to either Ansi or CCITT ADPCM (adaptive differential pulse code modulation), the spokeswoman explained. Alternatively, using CVSD coding, channels can be transmitted over the network at 32K-bits/sec or lower speeds, she added.

Since ADPCM uses only 32K-bits/sec for each voice channel, the capacity of the communications link is virtually doubled and the remaining bandwidth is available for other digital traffic.

The Link/2, which is due to become available in September, is said to be datalink-compatible with Timeplex's Link/1 facilities management system.

Timeplex Australia Pty Ltd, Suite 615, 275 Alfred St, N Sydney 2060. Tel: (02) 957 1660. Fax: (02) 925 0840.

Modem for local loops released

LILYDALE, Vic — An exchange area data modem that is intended for use over physical pairs on local loops to the same Telecom exchange, PABX local area or privately supplied point-to-point circuits, has been released by Dataplex Pty Ltd.

A spokesman said the DPX-215, which is available in several forms to suit a variety of applications, operates both synchronously and asynchronously at data rates to 19.2K-bits/sec and at distances up to 30km, depending on wire gauge and line characteristics.

The DPX-215 is available in two basic models, one approved by Telecom for use on Telecom maintained lines, and an identical modem fitted with surge suppressors. Both are available in desktop or rackmount configurations.

The spokesman said that the DPX-215 was user data transparent and required no change to hardware or software to implement sync or async, controlled or permanent carrier, or internal or external clock operation.

Dataplex Pty Ltd, 28 John St, Lilydale, Vic 3140. Tel: (03) 735 3333. Fax: (03) 735 3830.

Interface board for networking

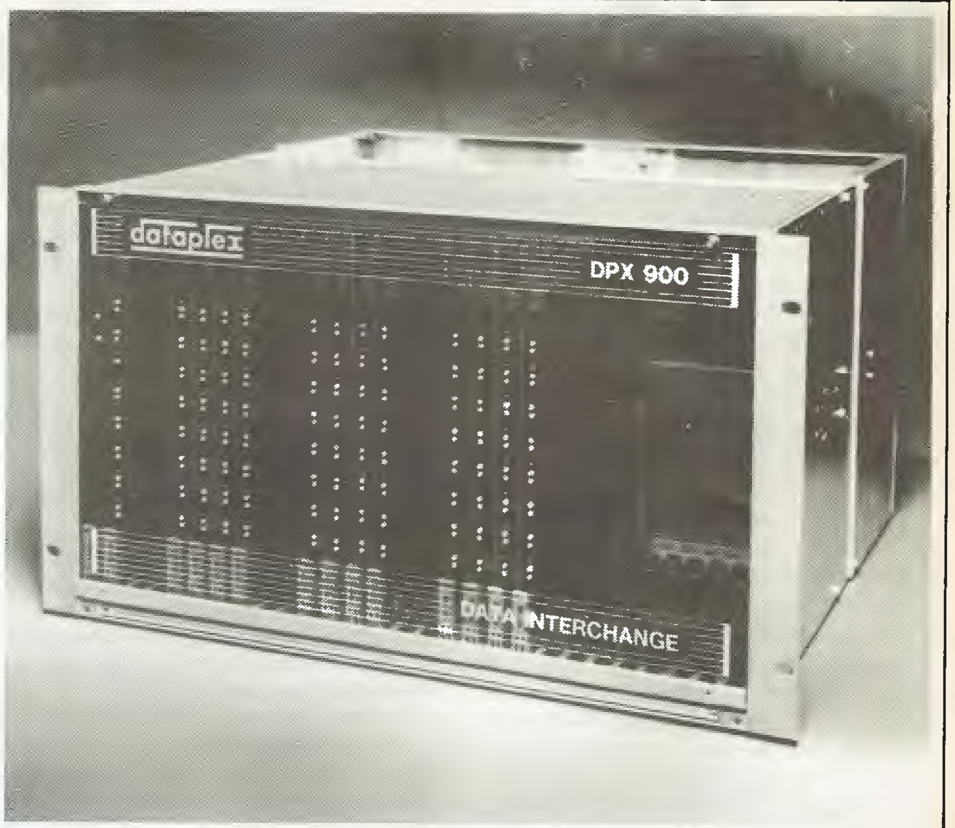
CHATSWOOD, NSW — Gandalf Pacific has introduced a synchronous interface board for its PACX 200 and PACX 2000 networking nodes.

A spokesman said the SSM 2083 interface was supplied as a four-channel module which allowed the PACX systems to be used in frontend switching and matrix switching applications in networks with IBM, Unisys and other mainframe computers which communicate synchronously.

The device interfaces up to four attached devices — such as personal computers, facsimile machines, minicomputers or mainframes — to a Gandalf controller. Features include 19.2K-bits/sec data operation; support of flexible channel configurations; c/control signal passthrough of up to six signals per device; and selectable DCE/DTE configuration, the spokesman said.

The SSM 2083 is available now for delivery to existing PACX users and for delivery with new systems.

Gandalf Pacific Pty Ltd, Suite 4, 47 Neridah St, Chatswood, NSW 2067. Tel: (02) 419 5977.



PBX features switching control

LILYDALE, Vic — Dataplex has released the DPX-900 Data Interchange, which was developed as the result of a two-year venture with Monash University.

A spokesman said the DPX-900 data PBX is intended to allow users of small to medium asynchronous networks to contend for resources. It also provides switching under user control, the spokesman added.

A DPX-900 can support eight to 248 ports, each operating at 19.2K-bits/sec. By interconnecting DPX-900s and the DPX-230 Streamline multiplexers, local data distribution networks can be built with more than 248 channels.

The DPX-900 uses telephone hookup wire to connect to terminals, PCs and host computers, and channel expansion is via octal cards. A second shelf is not required until interchange capacity exceeds 208 channels, the spokesman said.

Universal cards able to initiate and receive calls are designed to ensure that sparing is kept to a minimum and maximum flexibility is achieved.

Dataplex Pty Ltd, 28 John St, Lilydale, Vic 3140. Tel: (03) 735 3333. Fax: (03) 735 3830.

Cluster controllers enhanced

PENNANT HILLS, NSW — IBM has released upgraded models of its 3174 small cluster controllers, and has announced a family of desktop workstations for use with mainframes and intermediate systems.

A spokeswoman said the 3174 display station controllers Models 81R and 82R were designed for users requiring attachment of eight terminal devices or less. Hardware characteristics were the same as current 3174 models, but microcode enhancements provided a reduction in control unit customising time and additional keyboard support for the utility/diagnostics diskette procedures, she added.

The workstations — called the 3192 and 3197 — have been designed to provide color and advanced mono technology and allow attachment of a range of low-cost printers.

The 3192 models are for use with System 370 hosts, while the 3197 models are for use with the System/36 and System/38.

IBM Australia Ltd, Coonara Ave, West Pennant Hills, NSW 2120. Tel: (02) 634 9111.

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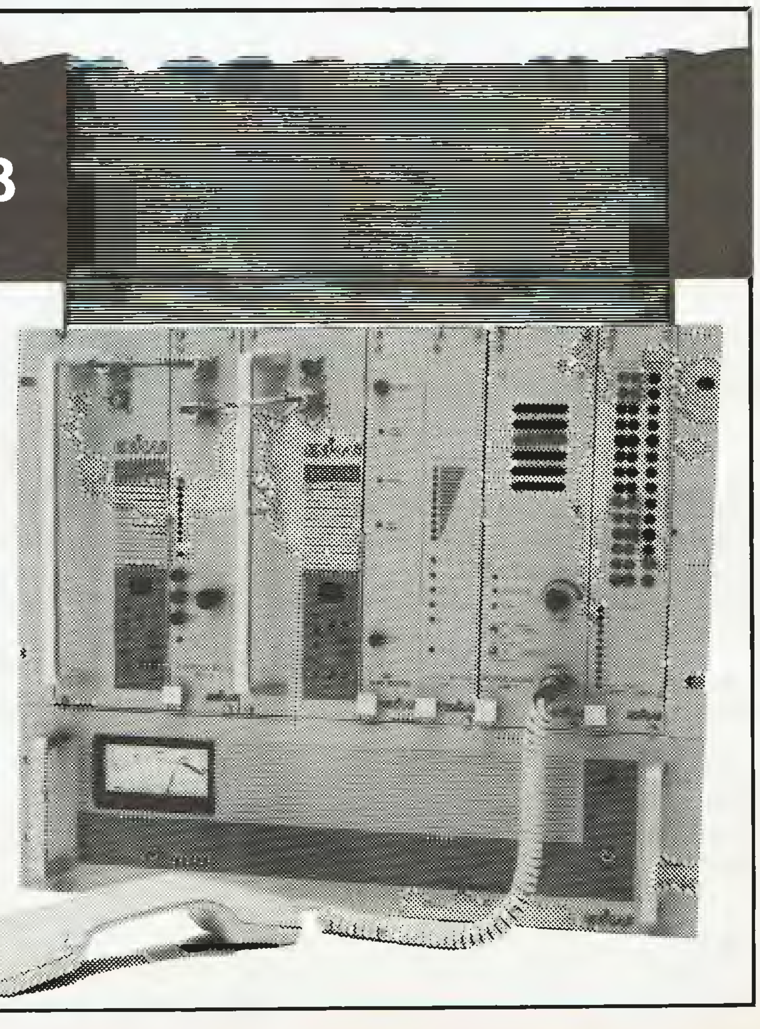


Australian distributor takes on CP Blue link

CHATSWOOD, NSW — The Australian developed CP Blue add-on PC board, which provides communications with up to 10 different mainframes, is to be distributed by Sourceware.

The product was developed by Computer Protocol as a universal micro-to-mainframe link board that would fit into a spare slot on any IBM PC or compatible machine.

CP Blue provides access to ICL, Honeywell, IBM, IBM compatible, Unisys (Burroughs and Sperry), NCR and Control Data mainframes, a Sourceware spokesman said.

Sourceware Pty Ltd, *586 Pacific Hway, Chatswood, NSW 2067. Tel: (02) 411 5711.*

Soft Spots

CAMBRIDGE, Mass — Lotus Development Corp, which is working on a number of networking products, has stumbled with its Networker system, which is intended to let existing copies of Lotus 1-2-3 and Symphony run on Lans. The company has delayed release of the product, due last quarter, indefinitely while functions suggested by beta test sites are added to it. Other products under development include a version of Express for Lans; an enhanced version of The Application Connection (which has not yet been released in Australia); and a new system code-named Casino intended to improve the interface between Lotus 1-2-3 and the Lotus Signal online stock quotation system.

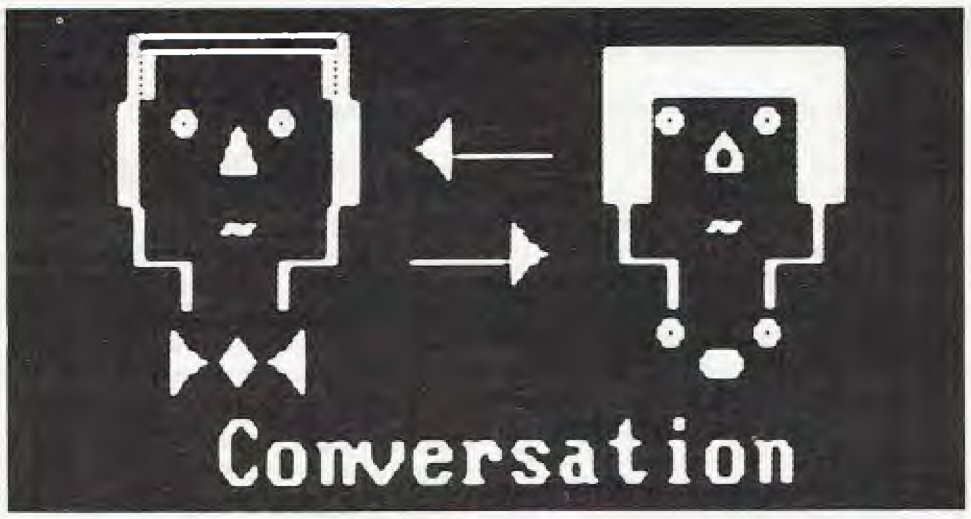
BLACKBURN, Vic — Hewlett-Packard Australia Ltd is to provide Sun Microsystem's NFS multivendor data communications in the technical workstation market. The company will provide NFS Revision 3 on its HP 9000 Series 300 workstations and on the HP 9000 Model 840 Precision Architecture system. Delivery of NFS is expected before the end of the year. In another move, HP is investigating AT&T's file access system for Unix operating systems. Until ready to support RFS, the company will continue to support a distributed file system for data relay among HP 9000 HP-Ux computers.

CANOGA PARK, California — Answer Systems has enhanced its micro-mainframe link software to support IBM's DB2 relational database management system. The product, Answer/DB, is designed to provide PC users with data from mainframe databases. It previously supported IBM's IMS, Cullinet's IDMS and Adabas from Software AG. Answer/DB is distributed in Australia by Datec Pty Ltd, 220 George St, Sydney 2000. Tel: (02) 241 1601.

BELMONT, California — A Lan version of the Paradox relational database for use with personal computers is due for imminent release. A spokesman for the product's developer, Ansa Software, said the company's goal is to provide a product that behaves as much like a single user product as possible. The networked version will include the capability for database administrators to track which users have accessed or changed data. Paradox is distributed in Australia by Imagineering, 77 Dunning Ave, Rosebery, NSW 2018. Tel: (02) 662 4499. Fax: (02) 663 3495.

LOS ANGELES, California — Harmony Technology Associates plans to release an enhanced version of its PC-to-PC software that supports voice and data transfer over a single telephone line. When used in synchronous mode, Version 2.0 of Cocompute allows two computer users to view and change an application program running on both computers, It has memory resident commands, allowing users to take turns operating a Dos application from either side of the telephone. It also supports a terminal mode that allows a remote user to access files and application software on another computer. Users at both locations can enter commands, which are viewed on both screens. Cocompute runs on IBM PCs, XTs, ATs and compatibles with 256K-bytes of Ram. It costs $US95 from Harmony at 3700 Sepulveda Blvd, Suite 332, West Los Angeles, California 90034. Tel: (213) 398 0878.

SAN FRANCISCO — IBM has not publicly backed Microsoft's new Lan Manager networking software for use with IBM's OS/2 operating software, but the developer believes it will become a standard for PC Lans. Microsoft officials were dismayed that IBM failed to mention Lan Manager at the Personal System/2 release, but claim to retain faith in the product's future.



Icons taken from the Tapestry Telex Manager screen.

Icon-based menu is built for corporate PC users

CHATSWOOD, NSW — The Tapestry PC networking software, developed in the UK by graduates of Cambridge University and impressive enough to be marketed in 17 countries by IBM, has been released in Australia through Sourceware.

Developed by four-year old company Torus Systems Ltd, Tapestry has been designed for ease of use by corporate users. It achieves that goal through a so-called "intuitive icon-user interface" which provides a simple menu system intended to isolate users from Dos. a spokesman said.

The icon-based menu contains symbols that represent standard office features. It allows a choice of applications from a selection of symbols including in and out trays, file drawers and cabinets, telephone and communications centre, the spokesman said.

Tapestry is intended for use on networks with a minimum of eight and a maximum of 100 network stations. It runs on the IBM PC XT. and AT, as well as compatible machines. None of the servers on the Lan is dedicated, so a Tapestry network can include as many file or print servers as required and all may be used simultaneously as workstations, the spokesman noted.

Tapestry supports IBM Netbios-compatible Lan hardware, including IBM's Token Ring and PC Network, 3Com's Etherlink, Ungermann-Bass' Net/One and AST's Resource Sharing Network. Torus also manufactures an Ethernet adapter card.

An electronic mail system included within Tapestry incorporates a text editor, which is also icon-driven. The same text editor is used in Tapestry's telex gateway, which controls incoming and outgoing telex messages.

A family of other gateways is available to allow remote access to the network through Remote Network Link; to a number of host systems, including IBM mainframes and DEC minicomputers, and to X.25 networks.

Sourceware Pty Ltd. 586 Pacific Hwy, Chatswood, NSW 2067. Tel: (02) 411 5711.

Macintosh-IBM network tool

ROSEBERY, NSW — An enhanced version of 3Com Corp's Etherseries software has been released to fully integrate Apple Macintosh computers into a network and to offer extended features for IBM PC users.

A spokesman for Australian distributor Imagineering said Etherseries Enhanced allowed users to instal, configure, administer and access a high performance network server from any Macintosh on the network. He said the system was the first dedicated, high performance server built to support a Macintosh network while still incorporating IBM PCs.

The enhanced software provides the network functions of data sharing, peripheral sharing, server-based print spooling and data security. It also enables network administrators to instal network software, monitor server status, manage printer queues and control tape backup operations.

Etherseries Enhanced is provided with user and server software and descriptive documentation. Versions for the Macintosh or IBM PCs and compatibles cost $A1540.

Imagineering, 77 Dunning Ave. Rosebery, NSW 2018. Tel: (02) 662 4499. Fax: (02) 663 3495.

Upgrade for 3+

ROSEBERY, NSW — A version of 3Com Corp's 3+ network operating system that has been enhanced to allow IBM personal computers to share data on local Ethernet and Token Ring networks and through remote modems or internetwork bridges will be released next month by Imagineering.

A spokesman said 3+ version 1.2 supports such Netbios applications as MDBS III version 3.09, PC Focus, Smartcom II, Crosstalk IV, Irmalan and PCox 3270 Gateway, as well as IBM Asynch Server. PC network and PC 3270 Emulation.

Suggested list price for 3+ version 1.2 is $A1900 for a network of up to five users.

Imagineering. 77 Dunning Ave, Rosebery, NSW 2018. Tel: (02) 662 4499. Fax: (02) 663 3495.

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Phone: (02) 411 5834; Telex: AA27220; Fax: (02) 419 2604

• PRODUCTS/SOFTWARE •

Boost for mail standard

SOUTH MELBOURNE — The recent implementation by Data General of the X.400 standard for electronic message handling is claimed to allow users of DG's Comprehensive Electronic Office (CEO) to exchange electronic mail with users of other X.400 compliant systems. Several other vendors, including IBM, have also announced support for X.400, and a group of 14 manufacturers (excluding IBM) combined in a demonstration of the standard's interoperability at the Hanover Fair in March.

A DG spokesman said the facility, which is built into CEO, will marketed as an enhancement to the office automation system. It uses the CEO's existing electronic mail menus and features to communicate directly with other X.400 systems.

CEO runs on DG's MV series of minicomputers and has about 3000 users in Australia, with a user base of about 170,000 worldwide, the spokesman claimed. "The inclusion of DG/X.400 will be of advantage to the many users who operate in multi-user environments, where the ability to communicate with other machines is critical", he said.

DG/X.400 will be priced according to processor size, and licences will vary in price from $A2600 on the MV/2000DC to $A19,000 on the MV/20000.

Data General Australia Pty Ltd, 100 Dorcas St, South Melbourne 3205. Tel: (03) 698 6988.

Resources swing behind X.400

By Trevor Hales

THE X.400 standard was developed by the CCITT (International Telephone and Telegraph Consultative Committee) in conjunction with the International Standards Organisation and the European Computer Manufacturers' Association.

X.400 is an application layer standard which specifies the protocols required to permit the reliable interchange of messages within a non-vendor-specific open system. That means a user on any computer system can easily send mail to a user of a machine from a different vendor. The standard also provides for the transmission of facsimile images within a message interchange.

Telecommunications organisations and computer manufacturers are allocating significant resources to develop and implement X.400, and the US and European public electronic mail systems will modify their services to conform.

In Australia, Telecom and OTC have agreed to change their systems (Telememo and Minerva) to the X.400 standard. ACSnet — the Australian Computer Science Network — is following a similar path in implementing X.400.

- *Trevor Hales is officer-in-charge, Csiro Division of Information Technology. His description of X.400 is reprinted with permission of the National Protocol Support Centre.*

Communication package for System/88

PENNANT HILLS, NSW — IBM Australia has released software that allows its System/88 fault tolerant system to communicate with host IBM mainframes. The release was made as IBM unveiled five enhanced models of the System/88.

A spokesman said the System/88 Distributed System Services program allows the machine, produced by Stratus but marketed by IBM, to communicate with the Distributed Systems Executive (DSX) program executing in a host IBM System/370.

The software is claimed to allow users at a central IBM host with DSX to manage System/88 program and data libraries and to schedule and track their distribution to a downstream System/88.

The spokesman said the program can be activated by an operator's command or when the system is powered on. In addition, an operator at the host may send to, retrieve from or delete programs, files panels and command macros on a System/88.

The spokesman said the System/88 supports logical section passthrough, enabling host DSX to establish sessions with logical units in downstream processors (including System/88s) and controllers.

IBM Australia Ltd, Coonara Ave, West Pennant Hills, NSW 2120. Tel: (02) 634 9111.

Security key to ACI interface

CLAYTON, Vic — A network interface that is claimed to provide additional security along with ease of use on IBM's Token Ring local area network (Lan) has been developed by ACI Computer Services.

A spokesman said the company's Ring-Master acts as a frontend to the system and reduces network administration functions to menu options without modifying the IBM software.

"With ACI's Ring-Master you can log into any system on the network and obtain access to your own personalised menu, private data and applications," the spokesman said. "A user name and password must be defined before accessing the network, and the password does not appear on the screen."

Ring-Master provides each workstation with network messaging and a customisable network login screen. However, the network server is protected by multiple levels of security so that the integrity of the network is protected. That password protection exists on all levels of the menu and on the network administration menu and functions, the spokesman added.

An Application Manager menu system and an Application Supervisor are automatically incorporated in Ring-Master applications.

ACI Computer Services, 310 Ferntree Gully Rd, North Clayton, Vic. Tel: (03) 541 5600.

• SERVICES •

Resources industry helped by Arid

SYDNEY — The Australian Resources Industry Database (Arid) has been established by Clirs Ltd and the Australian Mineral Foundation to service the resources industry.

A spokesman for Clirs said that Arid would contain: the Australian Earth Sciences Information System (Aesis) produced by the AMF; Aesis Bookshop, a hardcopy electronic ordering service. Minfinder, a report database on the geology and mineral resources of NSW including petroleum exploration licence and wells completion reports as well as the Corefinder references to 120,000 boxes of diamond drill core from the NSW Department of Mineral Resources; Samref from the SA Department of Mines and Energy; industry bulletins and directories; a coal intelligence database and access to overseas data through Clirs' international gateway to Pergamon Infoline and other mineral databases.

Users of Arid will also be able to monitor government activity affecting the resources industry and check relevant State and Commonwealth legislation, regulations and case law, the spokesman claimed.

A range of additional information services are to be added in coming months with the support of the Bureau of Mineral Resources and other sources of industry intelligence.

Development of Arid is to be coordinated by an advisory council of representatives to be invited from industry associations, State government departments and industry users.

Clirs Ltd, Level 39, MLC Centre, Martin Place, Sydney 2000. Tel: (02) 233 1955. Fax: (02) 233 2492.

More databases for Textline

SYDNEY — The Textline information retrieval service, which provides abstracts on company activities, industry trends, and economic and political developments, has been expanded and its facilities enhanced by operator Finsbury Data Services.

Additional database offerings are Country Briefs, which comprises business, economic and travel information on 207 countries; a list of sales leads and tenders; an airline and hotels guide; and schedules of forthcoming conferences exhibitions.

Enhancements to the service include stacking, enabling easier specification of search requirements by enabling steps through the system to be specified in one continuous string; easier access to indexing terms by allowing the program to be interrupted while a user consults the code lists; and increased facilities to redefine a search.

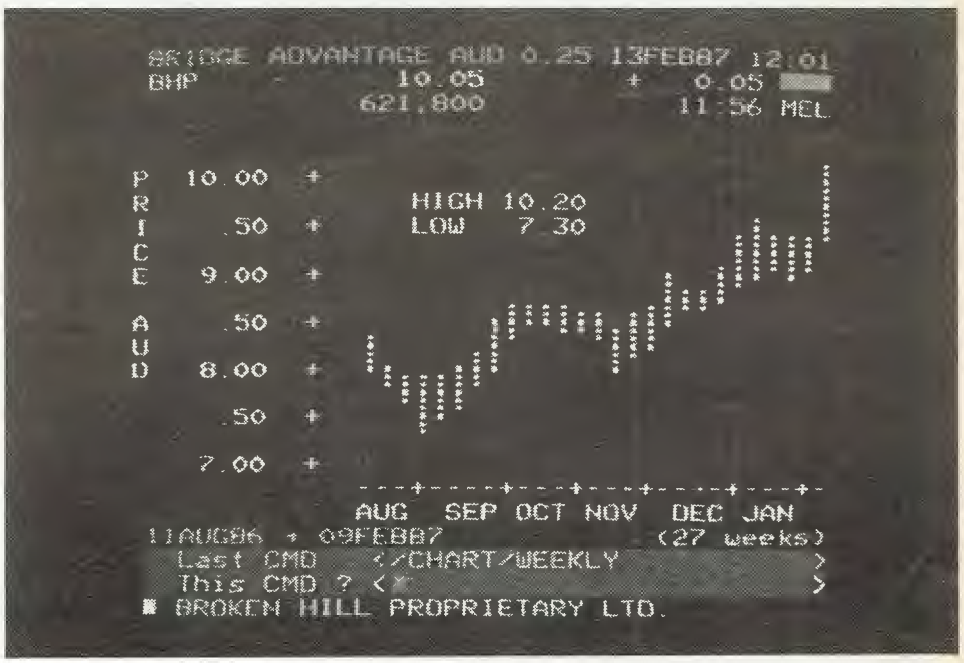
Dewe Rogerson Australia, 50 York St, Sydney 2000. Tel: (02) 261 2144. Fax: (02) 261 2059.

Chat opens up message sending

McCLEAN, Virginia — Telecomputing Corp has enhanced the Chat feature on its Source Information Network. It now allows users to send messages without interference from incoming messages. It also features both real and view modes, and a notification function that lets users access services while using the Chat mode.

Users have control over who will be invited to the conference and can send private messages to other users in a Chat conference using the whisper feature. They can also create an alias or nickname.

There is no extra charge to use Chat, and a surcharge reduction has been announced for Chat users with 1200 or 2400-bits/sec modems.



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An example of the Bridge Advantage financial service.

Bridging the information gap

SYDNEY — The Bridge Advantage financial service, which gives realtime information to investors via videotex, has been developed and released by a joint venture between Syscorp Pty Ltd and Bridge Data Australia Pty Ltd.

Bridge has been supplying local and international financial data for 12 years. Its Bridge Information System forms the heart of Bridge Advantage, allowing today's trading or historic security performance to be viewed as snapshots, financial results, price/volume charts, tabular data and performance analysis displays, a spokesman said.

It gives investor access to information from the Sydney, Melbourne, Perth, Adelaide, and Brisbane stock exchanges, Sydney Futures Exchange, the Hong Kong stock exchange and the Tokyo stock exchange. Other international exchanges will be made available soon, starting with the NZ stock and futures exchanges early next month.

In addition, online telebroking (placement of buy/sell orders via Bridge Advantage) is available to participating brokers. Hattersley Maxwell Noall Ltd and Pont Securities Ltd are brokers already taking part.

Charge components are an annual subscription amounting to less than $A8 a month, a prime time connect charge of $A5.40 per hour, and a transaction charge for access to information and services, the spokesman said.

Access via Viatel will be available from June 1 at a prime time connect charge of $A3 an hour plus the Viatel hourly connect charge.

The Bridge Advantage service will be implemented and marketed in NZ and Europe from July.

Bridge Data Australia Pty Ltd, 14th Floor, Royal Exchange Building, 56 Pitt St, Sydney 2000. Tel: (02) 27 8066. **Syscorp Pty Ltd,** 41 Military Rd, Neutral Bay, NSW 2089. Tel: (02) 908 1599.

Cloud over Paradyne clears

Lawsuit ends in $US8m settlement

MILSONS POINT, NSW — The conclusion of a four-year lawsuit has been a relief, although at a significant cost, for Paradyne Corp. "It is grand to hear it is over," said Ed Begg, Paradyne's networking systems product manager, in Sydney recently. "Now we will be able to go out and increase our business."

The suit ended in a $US8 million settlement with the US Department of Justice regarding an indictment accusing Paradyne of fraud in a government systems bid. The settlement dismissed all charges except conspiracy, to which the company pleaded guilty, and for which it will pay $US1.2 million in fines and related costs.

Government investigations alleged that Paradyne misled the US Social Security Administration at a key procurement test by secretly using a DEC PDP-11 processor instead of the Zilog Z800 processor it had proposed in its bid, and by bidding a controller that was not an off-the-shelf item.

According to the terms of the settlement, Paradyne's president and chief executive officer, Robert Wiggins, resigned. He had offered his resignation as a bargaining chip in the negotiations, and will be replaced by Jerry Kendall, formerly vice-president and chief operating officer.

As a result of the settlement Paradyne, which spent about $US18 million on legal costs, is free to conduct business with Washington,

"The only truly detrimental effect of the settlement is the loss of Wiggins," Begg said.

Begg was in Australia to "reintroduce Paradyne's Pixnet channel extension products" in conjunction with the distributor Techway Pty Ltd. Begg also finalised a distribution agreement for all Paradyne products with Data Bank in New Zealand.

Pixnet products are installed at about nine Australian sites. "The requirement here is almost the same as it is in the US market," Begg said. "It boils down to how DP departments can save money and provide services to their users. Pixnet/XL gives them the ability to provide computing power to a remote site that is without a computer."

The product was introduced in December 1984, and shipped in April the following year. It is now into its third generation and more than 700 units have been delivered worldwide.

Paradyne has annual revenues of more than $US300 million and employs more than 2000 people in the US, with another 1000 in other countries. It has subsidiaries in the UK, Japan and Canada.

For much of its revenue it still depends heavily on entry-level communications products such as modems. "It is a fierce market and margins are low," Begg noted.

He added, however, that the future is rosy for Pixnet/XL. A major part of Pixnet business is with financial institutions and other large companies "in acquisition mode — all buying and being bought. If both companies involved have IBM mainframes it is easy to standardise and, using the channel extension concept, consolidate all DP in one site.

"Similarly Pixnet is often installed when users decide they want a remote data centre, perhaps for disaster recovery," Begg added.

While DEC is making inroads to IBM traditional markets, Paradyne will not leap into the fray with a half-ready product. "DEC's is a tempting world," Begg admitted. "But if we go into the DEC market it will be as a long-term project."

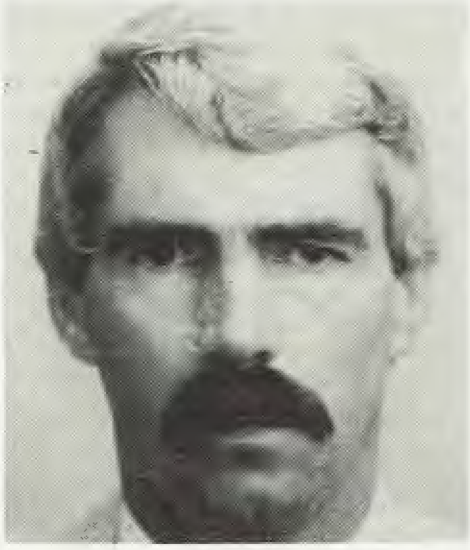
Timeplex takes an Australian plunge

NORTH SYDNEY — Timeplex Inc of New Jersey has opened an Australian subsidiary with offices in Sydney and Melbourne. Timeplex Australia Pty Ltd, will operate under the direction of general manager Garry Fahey.

"Timeplex Australia provides direct sales and support", said Fahey. "It is offering the full line of Timeplex communications equipment and systems to our Australian customers."

One of the first functions to be undertaken by the subsidiary is the launch of the Link/2 facilities management system. The company has got off to a flying start by already scoring its first sale of the system to Wang Computer Pty Ltd, an existing user of the Link/1.

Wang will integrate the system into its voice-data network of three interconnecting nodes in Melbourne, Canberra and Sydney. The network will be increased to include a Link/2 node at Rydalmere, Sydney, and the main Sydney node will be upgraded to a Link/2 site. The network will continue to be used for internal communications, a spokesman explained.


Garry Fahey . . . "direct sales and support"

Timplex's parent company was formed in the US in 1969 by a group of engineers. Initially it concentrated on designing, manufacturing and marketing a range of time division multiplexers. Since then it has moved to statistical multiplexers, and on to more sophisticated technologies such as large-scale backbone data networks and integrated voice and data network solutions.

The company employs more than 1500 people worldwide and closed its last financial year in June, 1986, with revenues of $US119 million, an increase of 24 per cent over the previous year's result.

Timeplex was formerly represented in Australia by Control Data, and its equipment is installed at sites in all States and territories. "Networks here encompass all products in the Timeplex lineup," Fahey claimed. The company will not initially establish its own maintenance network, but will work through AAP Reuters Communications in all State capitals.

"We have offices in Sydney and Melbourne, and a marketing representative in Queensland for the full range of products, from entry level up. The head office and technical assistance centre will be at North Sydney," Fahey added.

Timeplex Australia Pty Ltd, Suite 615, 275 Alfred St, North Sydney 2060. Tel: (02) 957 1660. Fax: (02) 925 0840.

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Voice messaging born out of one man's rage

SYDNEY — The biggest challenge facing Gordon Matthews is "getting the message of voice messaging across the world".

Matthews is founder and chairman of VMX Inc, a company that developed, manufactures and markets a voice messaging product which last year was used by "roughly one million people worldwide to send about 1000 million messages."

He described his company, headquartered in Texas, and his goals while in Australia to address Atug '87.

The company's Voice Message Exchange product, approved by Telecom late in 1986, already has one Australian user in ICI Australia Ltd *(Communications World, Mar, p1)*. Matthews believes many more companies could benefit from the technology, a claim he backs up by pointing to the US user list, which includes such names as Kodak, Coca-Cola, 3M and Ford.

"Voice messaging is the solution to a lot of problems suffered by international companies. It is a new type of technology that must be considered because it can give a competitive advantage and increased productivity," Matthews claimed.

He founded VMX in a rage. "Voice messaging started about 14 years ago while I was working in a Dallas plant at Honeywell. I was sent out to see a customer in Colorado in winter, and while I was waiting to go out to my car I saw something that irritated me — a huge trash bin that was full of memos and letters.

"I do not normally go through trash bins, but I did that day. And it made me mad. The contents of that bin had cost an enormous amount, and it was obviously wasteful and inefficient.

"I also realised how inefficient the phone had been that day — especially calling Dallas, which was in a different time zone. When I called people were out, and when they called back I was out.

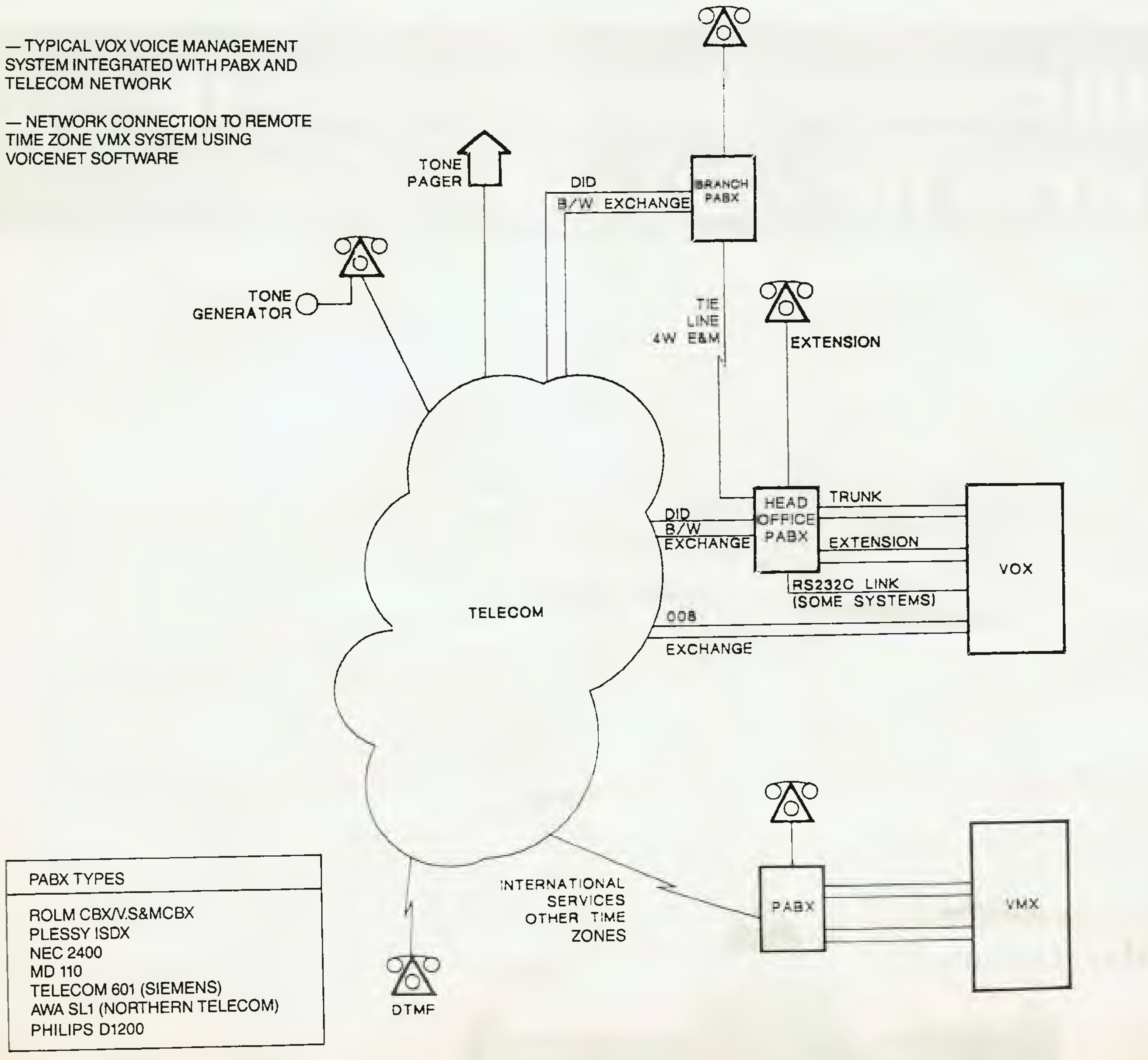
"The whole concept of voice messaging was fused in the following 30 minutes. I saw a product that could solve local and long-distance telephone tag, cut lengthy calls, stop interruptions, overcome time zone difficulties and reduce memos."

So it was that in 1978 Matthews started VMX and invented and patented the technology that would make possible his solutions to the wastage. The first installation of the Voice Message Exchange was made at 3M just two years later, and the company went public in 1983. The product is now marketed in 14 countries, including Germany and Japan.

Matthews said his company tends to be "very frugal" and to go for "the long-term goal instead of the short term". He boasts that VMX now has a bank balance of $US19 million, the same amount raised by a public float four years ago.

"We have a small board of directors, all of whom are very tough. They include venture capitalists, major industrialists and a representative of American Express. Only unanimous decisions are accepted."

In Australia the products are handled by Honeywell, and Matthews expects that company to add significant Australian content. "They import cards, software and a number of components from VMX. The product is fabricated at Honeywell's Waterloo (Sydney) plant, where it is brought to Telecom Australia's standards. There will be some local manufacture and some Honeywell input so that Australian content approaches 40 per cent."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PABX TYPES
ROLM CBX/V.S&MCBX
PLESSY ISDX
NEC 2400
MD 110
TELECOM 601 (SIEMENS)
AWA SL1 (NORTHERN TELECOM)
PHILIPS D1200

McKim will head Honeywell Bull

NORTH SYDNEY — The information systems company formed by Honeywell Inc, Compagnie des Machines Bull, and NEC Corp has begun operations under the name Honeywell Bull Inc.

The newly formed group is expected to continue to develop product lines in integrated systems that require strengths in networking, database management and transaction processing, a spokesman said.

John McKim has been appointed vice-president and managing director of Honeywell Bull Pacific Region. He has the additional titles of chairman and chief executive officer of the Australian company, which will be called Honeywell Bull Australia Pty Ltd.

The former Honeywell Information Systems management team for the Pacific continues to operate the company, which is expected to have 600 employees in Australia and NZ.

Worldwide operations are to be headed by Jacques Stern, chairman of the board. Stern was also chairman and chief executive officer of Bull. Jerome Meyer will assume the roles of president and chief executive.

John McKim . . . vice-president and managing director.

Industry Insight

☐ *TORONTO — IP Sharp Associates is to be bought by Reuters PLC of London in a transaction estimated to be about $US62.5 million. A spokesman for IP Sharp said almost all aspects of the company's business complemented the Reuters news and realtime financial data distribution systems. The company is expected to continue in its present form and with its present management and organisational structure. All current products and services will be maintained, the spokesman added. The transaction is expected to be completed by the end of May.*

☐ *MOUNTAINVIEW, California — Sun Microsystems Inc has announced its intention to acquire the developer of the Tops local area network software, Centram Systems West. Tops allows IBM and compatible PCs as well as Apple Macintosh computers to share data files without dedicated servers. Sun has filed a registration statement with the Securities Exchange Commission in connection with the 677,265 shares to be issued as part of Sun's takeover.*

☐ *TOKYO — Japan and the US have reached an accord to liberalise trans-Pacific value added network services between the two countries. An announcement by the US Department of Commerce and Japan's Ministry of Post and Telecommunications stated that the two nations will observe regulations of the International Telecommunications Union and treat transborder networks without partiality. The Japanese government plans to revise legislation and loosen existing service restrictions. The trans-Pacific Van services are expected to begin operation by June.*

☐ *NEW YORK — A group of 25 international telecommunications companies, including AT&T, have agreed to build and maintain the ninth trans-Atlantic telecommunications cable system (TAT-9), which is planned to go into service in October of 1991. The system will connect landing points in the US, Canada, the UK, France and Spain. It will provide a direct fibre optic link to southern Europe and on to countries in the Mediterranean area, and will provide backup for TAT-8, planned to begin operations in 1988. The system will use 1.5 micron laser technology and provide 565M-bits/sec over two working pairs of glass fibres.*

☐ *NEW YORK — A proposal by AT&T to increase the number of its common shares is believed to have been made in an effort to flesh out its data networking strategy through acquisitions. Although the company claimed the capital raised would "make more difficult, or costly, and less likely a takeover" (of AT&T), analysts believed the real intent of the action was to give the company the ability to finance large acquisitions. The company's finances were recently questioned by Moody's Investors Service, which lowered its rating of AT&T's preferred shares and debt, saying it expected AT&T to be forced into another write-down.*

☐ *LONDON — ICL appears to be gearing up for an assault on the Map market by negotiating to market the Cablestream networking product from UK network producer Information Technology Ltd. ITL is experienced in networking, which is essential for the success of Map and Top. Its Cablestream consists of a range of products for large networks and is capable of supporting Map and Tops as well as a full set of asynchronous, synchronous and PC services. It also allows users to run multiple services over a broadband network using a single, rugged cable to support a number of nets and thousands of terminals. As well as supporting Decnet, Cablestream also supports ICL's Oslan. ICL has installed a broadband Map network, dubbed Kidmap,at one of its UK manufacturing plants.*

Charmed life for UK Lan company

CHATSWOOD, NSW — A UK company that claims to be the only European manufacturer of local area networks has lived what many similar companies would claim is a charmed life since the birth of its first product in May, 1984.

While Torus Systems Ltd of Cambridge, England, took 18 months to develop the hardware and software for its first Lan it took less time to negotiate a deal under which IBM picked up distribution rights in 17 countries (excluding North America). And from the signing of that agreement in February 1985, Torus has not looked back. Its recent entry into Australia through Sourceware Pty Ltd is a further link in its international marketing chain.

Mike Holland, sales director for Torus, visited Australia to announce the distributorship. He said that the birth of the PC was the reason for the birth of Torus. "The PC then was a standalone machine always destined to become much more functional. The mission of the founders of Torus was to create a product that took out the hype and made the PC into a business tool."

Steve Ives, the founder, had the idea, and he set up Torus with a group of Cambridge graduates to develop the product.

That product was the Icon Lan and the Tapestry networking software, a system that was designed for use by businessmen rather than by PC experts. The system uses menus with easily identifiable icons representing its major functions.

"Our strategy is simplicity, and we are totally committed to identifying and tracking standards", Holland said. "We want to make the product and the solution future-proof," he added.

Extending the net

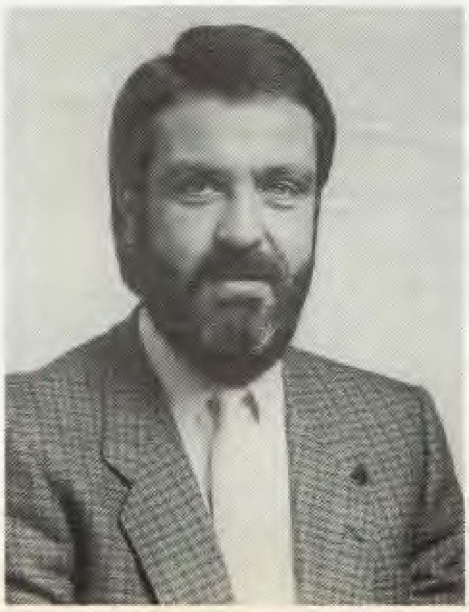
So far, the software is limited to 100 or fewer nodes on a single network, and Holland admitted the need to extend this possibly into large networks supporting up to 1000 nodes. However, Torus, through its 20-strong development team, will follow its own path. "We are looking at what we call a domain manager to control the network within his domain. However, through the domain managers, any workstation will be able to contact other domains. That is, we are looking at the internetworking of like and unlike networks."

Torus employs a total of 59 people at its headquarters in Cambridge and has two offices in the US.

Holland said the unaudited revenue for the group (including the US) in 1986 was 5.15 million pounds. The group has budgeted for considerable expansion in 1987.

"This year international distribution represents around 30 per cent of total revenue and will amount to about 3 million pounds," Holland claimed. "By 1988 we expect 60 per cent of our total revenue to be generated offshore from our distributors and our operations in the US."

Having establishing Sourceware as Australian distributor, Torus will now be moving into South-East Asia, looking first at Hong Kong and then at establishing operations in Singapore, Kuala Lumpur, Manila, Bangkok and China.



Mike Holland . . . "Strategy is simplicity".

Novell takeover

SYDNEY — The takeover of micro-mainframe link vendor, CXI, by Novell Inc has been completed after receiving approval by the company's shareholders. Bill Potts, international sales manager for CXI, said in Sydney soon after completion of the deal that there would be no immediate changes for his company and its operations.

"I predict that CXI will continue to do what it does best," Potts said. "We are important to the new parent, because without CXI Novell doesn't have a mainframe link." CXI offers links to IBM mainframes as well as to the System/34, /36 and /38 at a number of levels.

Potts noted that CXI had an annual revenue in excess of $US20 million. Internationally its products are marketed in Europe, Scandinavia, the UK, South-East Asia and Australia, where it is represented by Techpacific, but the bulk of its business is recorded in the US.

Systems cut phone bills

SURREY HILLS, Vic — Telephone information management systems being offered as a bureau service by Telecost Pty Ltd are intended to bring savings for any company with annnual telephone bills greater than $A25,000.

A spokesman said the service was being offered as a complete telephone call accounting and management information system without necessitating equipment purchase and maintenance. At a charge of about $A1.50 per extension, Telecost will instal on the customer's premises a solid state data storage unit (DSU) to collect data from the electronic PABX.

Data relating to all telephone calls from the customer's PABX are transferred to the DSU, processed and stored. The bureau service's host computer polls the DSU each night, and extracts the data for use in the customer's monthly reports.

The spokesman said it was possible to obtain extension highlight reports for details of calls exceeding a specified cost or duration; audit reports showing the value of all calls made and the services used (STD, ISD, and so on); department totals, traffic reports; the 10 most expensive numbers dialled and the 10 most frequently called numbers.

The most telling of the benefits is the ability to cut future telephone bills by at least 10 per cent, the spokesman claimed.

From a management information point of view the advantages include the ability to monitor and allocate telephone costs with greater accuracy; departmental cost allocation; identification of possible abuse of the system; and the provision of additional information for planning future communication needs.

Telecost Pty Ltd, 486 Whitehorse Rd, Surrey Hills, Vic 3127. Tel: (03) 836 0322.

LOOK
WHAT'S COMING UP IN FUTURE ISSUES OF COMMUNICATIONS WORLD

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PLUS Fibre Optics — Technology & Utilisation
Advertising Deadline: May 8

JULY: Satellite Communications and Equipment
PLUS Electronic mail, telex and fax
Advertising Deadline: June 12

AUG: Network Management — the factors of control, diagnostics and personnel
PLUS Voice messaging systems
Advertising Deadline: July 10

SEPT: Intelligent Buildings — planning ahead for a total communications solution
PLUS PCs in the communications revolution
MAJOR SUPPLEMENT!
Advertising Deadline: August 7

OCT: ISDN — Big Business begins to assess the benefits
PLUS Voice-data integration
Advertising Deadline: Sept 11

NOV: High Speed Modems
PLUS Videotex
Advertising Deadline: Oct 9

Dec/Jan: Private Networks — Answers or ambush in Australia today
PLUS Review of 1987
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1. What is your primary job function?
(Please circle one only)

01 Director/Partner/General Manager
02 Co Secretary/Financial Controller/Accountant
03 Director/Manager of Office Admin
04 Director/Manager of MIS
05 Director/Manager of DP/ADP
06 Projects Manager
07 Systems Software Management/Development
08 Manager/supervisor operations
09 Systems analyst
10 Analyst/Programmers
11 Programmers
12 Operations Staff
13 Database administrators
14 Communications Manager
15 PC/Micro Managers
16 PC/Micro specialists
17 Computer Consultants
18 Communications Consultant
19 Computer Contractors
20 Consultants (other that Computer consultants)
21 Technical/Scientific/R&D
22 Computer Sales/Marketing
23 Sales/Marketing (other)
24 Librarian/Educator
25 Lawyer/Medicine
26 Student
27 Other

2. What is the primary business activity of your company/organisation? (Circle one only)

01 Manufacturer — Computer/DP Hardware/Peripherals
02 Manufacturer — all other excl. computers and electronics
03 DP Service bureau/software/planning/consulting
04 Public Utilities/Communications Systems/Transportation
05 Wholesale/Retail
06 Finance/Insurance/Banking
07 Mining/Construction/Oil and Refining
08 Business services (not DP)/Real Estate
09 Education/Medicine/Low
10 Government-Federal/State/Local
11 Printing/Publishing/other communication services
12 PR and Advertising
13 Communications consulting services
14 Manufacturer-communications systems equipment
15 Other

3. In your company, please indicate your primary functional involvement with communications.

	Data	Voice	Image
Planning/ Development			
Operations			
Management			

4. Which best describes your organisation's involvement with communications? (Please circle one only.)

A. Commercial or institutional enduser of communication systems and equipment (including all industries and businesses).
B. Government — Federal/State/local (including military).
C. Interconnect (including manufacturer, contractor, wholesaler or other vendor).
D. Communication service (including common carriers, telephone companies, utilities and broadcasting).
E. Systems integrators, systems and software houses, service bureaus and consultants.
F. Other (please specify).

5. What size is your organisation by employee numbers (circle one).

01 Very small (less than 50 employees)
02 Small (50-250)
03 Small/medium (250-500)
04 Medium (500-1000)
05 Medium/large (1000-5000)
06 Large (5000-10,000)
07 Very large (10,000 plus)

6. In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply.

1. Recommend/specify
2. Identify/evaluate potential vendors
3. Approve the acquisition
4. None of the above

7. Check ALL that apply in columns A and B.

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A B *Product/Services*

Computers
01 ☐ ☐ Personal computers
02 ☐ ☐ Minis
03 ☐ ☐ Mainframes

Data Communications
04 ☐ ☐ Communications processors
05 ☐ ☐ Comm./networks software
06 ☐ ☐ Digital switching equipment
07 ☐ ☐ Facsimile
08 ☐ ☐ Modems
09 ☐ ☐ Multiplexers
10 ☐ ☐ Protocol converters
11 ☐ ☐ Network mgmt & control
12 ☐ ☐ Test equipment
13 ☐ ☐ 3270 controllers

Telecommunications
14. ☐ ☐ PABX
15. ☐ ☐ Commander/key systems
16. ☐ ☐ Integrated voice/data terminals

A B *Product/Services*

Transmission/Network Services Equipment
17. ☐ ☐ Microwave
18. ☐ ☐ Satellite earth stations
19. ☐ ☐ Local area networks
20. ☐ ☐ Wide area networks
21. ☐ ☐ Packet switching equipment
22. ☐ ☐ Fibre optic equipment

Communications Services
23. ☐ ☐ Packet switching services
24. ☐ ☐ Cellular mobile radio services
25. ☐ ☐ Electronic mail
26. ☐ ☐ Enhanced services
27. ☐ ☐ Paging systems

8. How much (estimate) does your company spend annually on communications?

$	0-50,000	50-250,000	250-500,000	500-1 mil	1-5 million	5 million +
capital						
ongoing						

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Olsen of DEC: a chat over networks

Ken Olsen, the flamboyant founder of Digital Equipment Corp, has recently made several outspoken criticisms of the Manufacturing Automation Protocol, despite his company's early efforts to help General Motors have Map adopted as a standard for factory networking. Seemingly enjoying his role as devil's advocate, Olsen was similarly outspoken on a number of other subjects when interviewed by Bruce Hoard and Steve Moore of our US sister publication, *Network World.*

Question: Should data processing managers or MIS managers control voice and data communications as well as data processing?
Olsen: Voice communications have little to do with computer networks. There's no question that between buildings, countries, computer have access to all means of communications, whether they be telephone, satellite, fibre or microwave. But in general, we see little reason for tying telephones and computers together within a campus or building. Sometimes, both jobs are dumped on someone — that's just because no one else wants the telephone job.

Our Decconnect wall jack has connections for Ethernet, video, telephone and low-speed data, and we say it's integrated because it all comes in neatly in one place, but once it gets beyond there, the telephone is separated. As far as telephones are concerned, the technology is slow-moving and the standards tend to be political. It's completely different with computers, so just freeing them up from each other is the obvious ways to go.

The next question is, 'What about ISDN?' It means different things to different people, and of course we're all for the efficiencies you can gain in transmission between buildings, but we don't see any reason for ISDN in the offices or on the desk.

If we had ISDN 10 years ago, we probably would have fallen in love with it, but since then networking has developed so much, it means much more than just simple communications. In many parts of your operation, you want to be able to swap data and computing. You want much higher speed and much more freedom than when using a telephone line.

So 10 years ago it might have been fine, but today our ideas, desires and needs in networking are way beyond ISDN. The ideas and standards haven't been accepted yet. And after that, all the tedious details necessary to make it useful in an office have to be worked out.

In other words, they're not going to hold back their own workers in order to meet some arbitrary standard they selected a long time ago.

Q: Even through you say we don't need ISDN now, won't there eventually be a need for some sort of functional integration of voice and data capabilities?
Olsen: Why? Because some magazine wrote it? The idea came from some reporter who said, 'Gee, they both use the same technology, they ought to be done by the same company'. So everybody started marrying companies, and the idea sings musically or something, but that's about it. The reliability you want is completely different, the types of people are different, the technologies are very different and there's no relationship between them. Telephones are all political, because the standards take forever to get through and then they last forever. In computers, we change things all the time with no politics at all.

The question we didn't answer is, we are going to get married to some telephone company? No, because that is so important we want to have access to all of them.

Q: There's a lot of talk these days about a new job title: chief information officer, or CIO. How many of these people do you personally know of, and what role should they play in corporate network implementation?
Olsen: I don't know how many of them there are. With that title I think you obviously get the telephone and the computer networks, any inside mail and a few things. It's not far enough along to draw conclusions, but the people who seem best at this are usually taken from a line position. They're president of a division or some other corporate unit, so they understand all aspects of the business, and some of them are MIS.

MIS people, you know, are not dumb. It's just that their job is different. Some MIS directors are very competent and immediately become broad when the problem becomes broad. Most companies change their way of organising very slowly. And right now, most of them are busy either acquiring or being terrified about being acquired.

Q: It's been estimated that only about 10 per cent of Fortune 1000 companies are using networking as a strategic weapon. Do you think that's reasonable figure?
Olsen: Very few are using it at all to a useful degree, that's probably a good measure. We see an awful lot of networking in which people have particular problems to solve, but they don't really have the vision of what networking will do for them overall. That's still to come. It's obvious that (networking is) where they're going to go, but most of them don't have that vision quite yet.

Q: You sound patient when you say that.
Olsen: Oh yes, it took us 20 years to sell interactive computing.

Q: Now that we have diskless PCs and multi-user, multitasking local network servers, what are your thoughts about the perennial argument over the relative merits of minicomputers and local networks?

Olsen: I don't know about that argument. The conflict between PCs in a network and minicomputers is almost irrelevant. The important argument was the people said that PCs would do everything.

And they also said very clearly, and all the data backed them up, that people want to go off and buy their own PCs and their own software. This is blatant foolishness, because if you're going to work in an organisation, you're got to work together. Everybody has to have computers to work together. They have to have the same software everywhere, so that every time a budget comes up, for example, it will be in the same format they were used to last time and not a brand new one.

The idea of a PC is just, by title, in contradiction to the needs of an organisation, where you want to work together, not as individuals. We're very conscious of that conflict. Some people say that what caused the computer recession was excessive investment in PCs. It ended up doing almost nothing for organisations because it was a bunch of people wasting their time working off in their own directions and not working together.

The obvious answer was networking them together, sometimes using them only as terminals.

Q: You seem to be arguing for a companywide networking strategy. What are the biggest obstacles you run up against in convincing people to agree with that?
Olsen: Two things. Everybody wants to build their own network, and every department wants to build its own network and often even design its own network. It's a natural reaction for every part of a company to want to be different from every other part.

When I was out at the Autofact ('87) show, they had a program that showed the organisation drawn as concentric circles, and in the centre was manufacturing. If the engineers had a convention, they would have drawn concentric circles with engineering in the centre, and office people would have had the office in the centre.

It is not natural for people to think that networking should go beyond the boundaries of their department — and that's the broad thinkers. Most of them don't even think beyond the boundaries of their own offices.

So the first thing is to convince people that if you're really going to get a company to work together and exploit networking, you have to use the same networking all over. It sounds obvious, but it's not human nature. And then to top it off, everybody would like to invent their own network.

A few years ago, everbody wanted to make their own computer; that's why we have 500 to 700 different PCs. Everybody had to go out and make their own, each one slightly better than everyone else's.

And there are probably 500 ways you can make a network. We say we've gone over every one of them, but I'm sure we haven't. Some small companies had six or eight different networks, and they all worked — for very small networks.

Advertisement

Linking Ethernet to Ethernet

This column is the first of a regular series written and inserted by **Network Solutions Australia Pty Ltd.** *Its aim is to highlight and provide information on solutions currently available to Australian communications users in the data comms field.*

By Richard Freemantle, General Manager, Network Solutions Pty Ltd

LINKING together multiple local area networks has become one of the communications industries major challenges for the future. The problem has been exacerbated by the conflicting physical media (broadband, baseband, coax and fibre-optic) used in local area networks and the choice of higher level protocols (XNS, TCP/IP, OSI, LAT, Decnet).

This article is the first in a series designed to probe for some of the answers to these and other communications challenges.

Before looking at solutions to the problem it is worthwhile exploring Internetwork Technology and defining some of the terms. Internetwork bridges are devices that allow Lans to be interconnected to extend distance span or to integrate multiple technologies. However, there are different ways to achieve Lan-to-Lan interconnection. To fully understand the various ways of interconnection and to better understand the Internetwork bridges, one needs to take a look at the different layers of the ISO Open Systems Interconnect (OSI) model.

In the OSI model, the first layer is the physical layer which defines the rules (such as electrical level and physical characteristics) of communicating across the actual transmission media. It also specifies the means of joining two cable segments together by means of a repeater.

A repeater merely accepts data bits on one side and retransmits them to the other side. In the process, it allows the original signals to travel a longer distance. In the Ethernet specification, a single segment is limited to 500 metres. Using repeaters, Ethernet can be extended to 1500 metres (using a maximum of two repeaters according to Version 1 Ethernet), or 2800 metres (using a maximum of four repeaters, per Version 2/IEEE 802.3). However, the connected segments are one physical Lan and all traffic is present on each segment.

The OSI layer two defines the data link layer. In the data link layer, data bits are grouped as packets. Each packet contains a source address and a destination address. Here the rules define how these packets can access the physical media (ie, Media Access Control or MAC) and how the packets should be treated by upper layer protocols (that is, packet type information and logical link control information). Internetwork bridges operate at this layer to interconnect two physically distinct Lan's together to form an extended Lan.

Bridges do not retransmit all traffic like a repeater. Bridges receive all packets on the network. They filter (discard) packets destined for the local side and forward (regenerate) only the packets that are destined for the remote side. In this way, bridges route packets based strictly on the destination address and do not depend on any routing protocol. Network devices on each side of a bridge simply address the packets to other devices as if they were on the same Lan; they never knowingly communicate with a bridge. Bridges also do not depend on any other protocol beyond the link layer addresses (that is, they are "protocol independent").

These bridges can be intelligent and they are able to "learn" which devices are on which side by monitoring the source addresses of all packets. They build a routing table based on the source address and on the corresponding side at which it was received. Thus, whenever a device transmits a packet, its location is detected by the bridge and an entry is made in the routing table. This "learned" table is then used for the filtering and forwarding operations described above.

The OSI layer three defines the network layer. In the network layer, rules are defined to interconnect networks (Lans are a subset of general networks) together to form an internet. In particular, network addresses such as IP addresses and XNS network addresses are used to distinguish one Lan from another. A network router can be used to join one Lan to another. Lans connected by a router are physically and logically separated networks; whereas, Lans connected by a bridge are physically different networks but logically the same networks (they share the same network address).

The network layer also defines the rules for passing routing information and making routing decisions (that is, the requirement for internetworking and routing protocol such as XNS's IDP and RIP). Each network device wanting to use a router must participate in the same internet protocol and explicity address the router to forward any internet packets. A router simply forwards any incoming packets but does not monitor as a traffic filter. Routers can be used to build an internet with a complex network topology containing many Lans with multiple communication paths and loops. Each network or Lan within an internet can support its own network management functions without interfering with others. Thus, routers are used in different applications from bridges; just as bridges are used differently from repeaters. They provide interconnection of Lans at different levels and provide different functions and capabilities.

To summarise the decision making process, when linking together two or more Ethernet (IEEE 802.3) systems, users need to balance the sometimes conflicting objectives of cost, performance and the vendor independent nature of the equipment before reaching a decision.

The devices that, today, offer the best combination of these features are the level two (OSI) bridges which should:

☐ Use Data link layer addresses for routing. This means that the devices can be used as a universal router to pass data between any two Ethernets independent of protocol. It is an ideal product for a multivendor environment where incompatible high level protocol sets such as XNS, TCP/IP, Decnet, or Lat must co-exist.

☐ Possess auto learning capabilities which an automatically detect and adjust to changes in network configuration. Addition and deletion of network devices can be accomplished without changing any routing tables.

☐ Possess Integrated Network Management which obviate the need for additional hardware or software. Such network management commands will provide the functionality needed to support the actual control and observation of the bridge and enable the various bridges in the network to be managed from a central point.

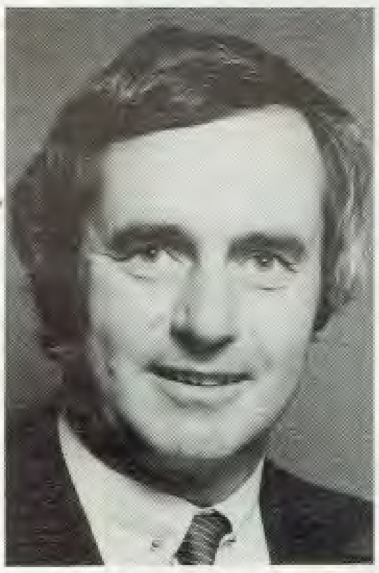
☐ Provide a generalised filtering capability which can offer more than just local traffic filtering. Ideally the bridge should permit the user to define various masks which filter out certain types of packet format, like all broadcast packets or all packets of a certain protocol type.

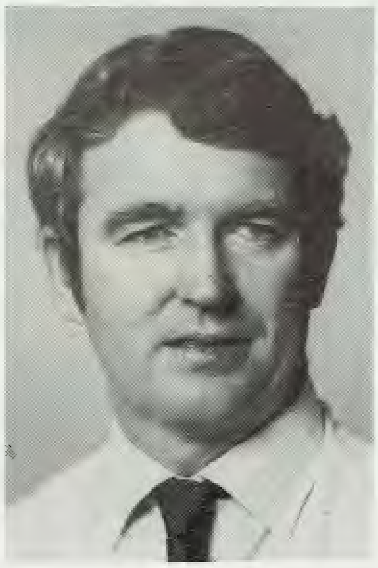
☐ Provide high performance packet processing enabling the bridge to handle the loads of a fully laden Ethernet (both for host to host and terminal to host traffic) without impacting performance.

For further information or to arrange for a discussion on how these products may benefit you contact the Network Solutions office in your State.

• COMMS SWITCHES •

Vic Whitely


Les Morrison


Alistair Pope

James Birch

Ray Quigley

Vic Whitely, former managing director of Concurrent Computers, has been appointed manager of the business systems division at Philips Communications Ltd, a division of Philips Industrial Holdings Ltd.

The Melbourne-based publishing company and information provider, Information Exchange Pty Ltd, has appointed **Simon Dillworth** technical director.

Scitec Communication Systems has appointed **Les Morrison** to the position of ACT branch manager and manager for government in Australasia. Morrison previously worked for the Defence Department in Australia and overseas.

Two new appointments have been announced at Vianetix Australia Pty Ltd. **John Sperotto** will become general manager, while **Tony Jamieson** will fill the national sales manager's role after moving from Datacraft.

The new southern region sales manager for Data Cable Pty Ltd is **Rodney Champion,** who will be responsible for the company's sales in Victoria, South Australia, Western Australia and Tasmania. Data Cable's former national sales manager, **Laurie Agnello**, has been appointed division manager of the new Dacos Electronics Division, which is primarily involved in research and development.

Datacraft Service Pty Ltd has made three senior appointments to spearhead its thrust into the computer and communications markts. **John Kratky** is now responsible for all services, sales and marketing, while **Graham Gourley** has been appointed administration manager. **Alistair Pope** has been appointed services support manager.

The Techway Group has appointed **James Birch** as marketing manager for its communications products, based in Sydney. Birch joins Techway from Unisys (the company formed by the merger of Burroughs and Sperry) where he was formerly director of communications marketing. Techway has also appointed **Peter Smith** to the recently created position of ACT sales manager. Smith was also previously with Unisys as a senior account manager (on Sperry products).

The Consumer Electronics Suppliers Association has appointed **John Green** director of marketing and sales for General Corporation Japan (Aust) Pty Ltd as chairman for 1987, and **Bruce Meech,** company secretary for Mitsubishi Electric AWA Pty Ltd, as vice-chairman.

Logica Pty Ltd has announced a number of new appointments, including **Scott McGeechan** to business centre manager for the ACT, and **Vergil Iliescu** to a senior consultant's position in Sydney. McGeechan was formerly senior communications consultant in Logica's Canberra office, and Iliescu joined the company after 12 years with Telecom.

Hypertec Pty Ltd has appointed **Mark Rewhorn** to the position of operations manager. He was a technical officer at Telecom for 15 years.

The newly created position of key account manager for the northern region for Sourceware Pty Ltd is **Mark Glann.** He will be responsible for coordinating and implementing distribution of the product range among the company's dealers in NSW, Queensland, the ACT, and the Northern Territory.

Formerly of Deloitte Haskins & Sells, **Vetta Malyna** has been appointed director of sales and marketing at the SNS Group. The company has also appointed **Tony Hyams** as local area networking specialist for its Canberra operations. He will be responsible for marketing and supporting the Waterloo Port. SNS expects to fill other management positions in the near future.

Ray Quigley has been appointed southern region manager of the business communications system division of STC. Based In Melbourne, his area of responsibility covers Victoria, South Australia, Western Australia and Tasmania. Before moving to STC Quigley was a partner in a small software house. He had previously been Victorian manager for Prime Computer.

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